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ABSTRACT

A summary and comparison of the statistical analysis and results of the first three GUME research projects investigating foreign language teaching methods are presented in this report. The methods investigated are the habit-formation or implicit theory and the cognitive-code learning or explicit theory with either source-language or target-language explanations. Design problems, measuring instruments, statistics, background variables, and the outcomes of the teaching methods themselves are all considered for the three projects. Tables illustrate the variables and the statistical findings of the projects. According to the analysis, there are no significant differences between the results of the three teaching methods. Appendixes provide descriptions of the oral drills and instructional explanations as well as an account of the pedagogical principles used in structuring the teaching materials. A bibliography is also provided. Related documents can be found through the following reference numbers: Project 1, ED 034 172; Project 2, FL 002 818; Project 3, FL 002 819; Project 4, ED 045 969; Project 5, FL 002 814; Adult Project, FL 002 868. (VM)

ED 060682

The GUME project

Lennart Levin

IMPLICIT AND EXPLICIT

A Synopsis of Three Experiments in Applied Psycholinguistics Assessing Different Methods of Teaching Grammatical Structures in English as a Foreign Language

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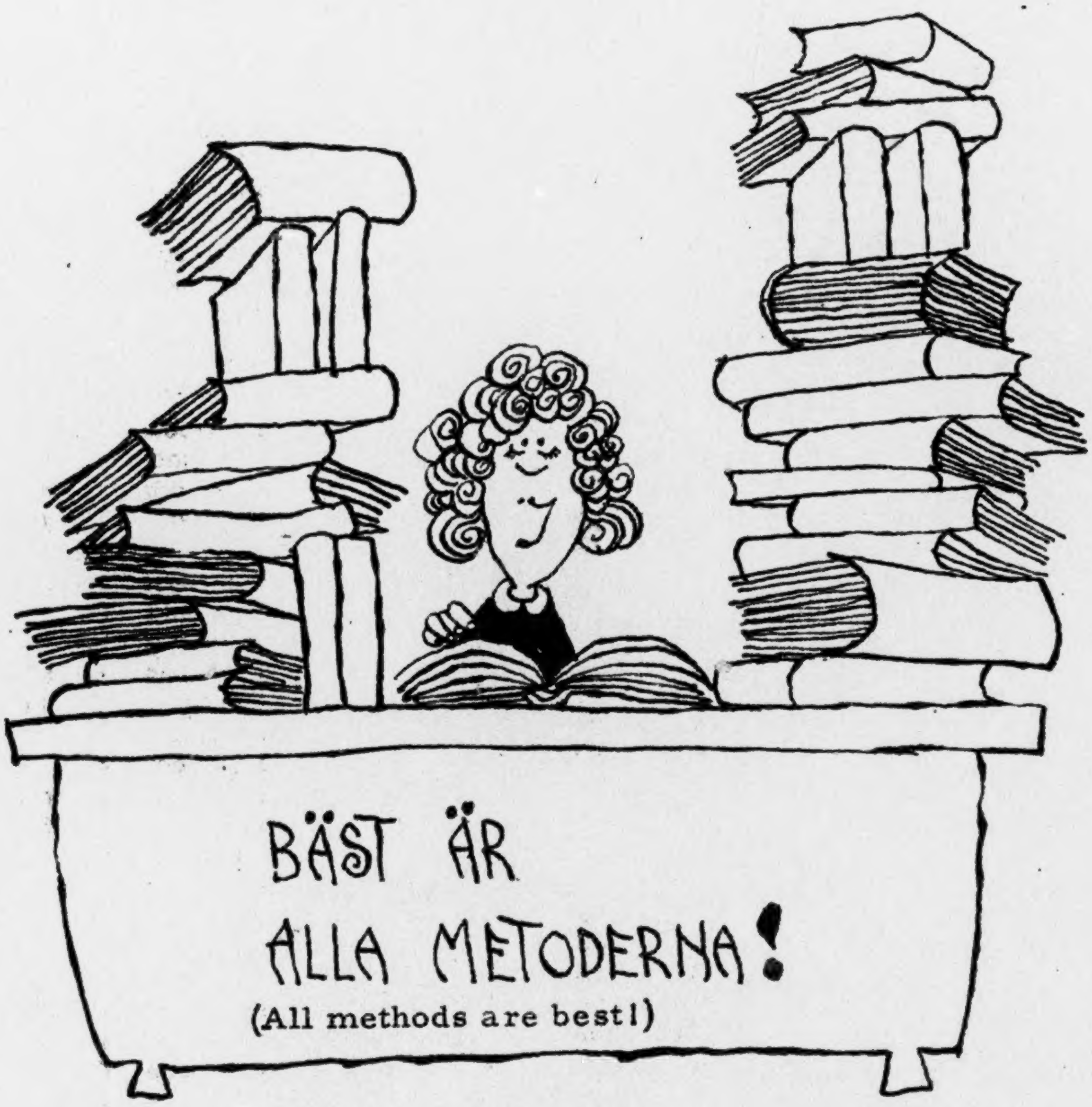
BÄST ÄR
ALLA METODERNA!
(All methods are best!)

LÄRARTIDNINGEN/SVENSK SKOLTIDNING · 24—25/1969

In the GUME-project (Göteborg/Undervisnings/Metod/Engelska = Gothenburg/Teaching/Methods/English) three different methods of teaching grammatical structures in English as a foreign language are being investigated. Three parallel studies, identical in design, are carried out in grade 7 where the Swedish pupils are approximately 14 years of age. Three different areas of English syntax, known to cause Swedish students difficulty, are selected for investigation: the do-construction, the some/any dichotomy, the passive voice. Three different strategies of teaching are being compared: the Implicit method, the Explicit-English method, and the Explicit-Swedish method. In all the methods the students have systematized drills; in Ee and Es the students have analysis and explanations as well. In Ee these explanations are given in the target language and in Es in the source language. In Es comparisons are also made with corresponding grammatical structures in Swedish.

The statistical techniques used in carrying out the method comparisons are analysis of covariance and analysis of variance (one-way and two-way classification).

NOTE

The bibliography (see pp. 81-83) includes three IMPLICIT AND EXPLICIT reports in English. They have been written by the part-project leaders for GUME 1 (Torsten Lindblad), GUME 2 (Ingvar Carlsson) and GUME 3 (Margareta Olsson) respectively and give more detailed information about the three part-projects than this comprehensive report.

The part-project reports are available on request from the Department of Educational Research, Gothenburg School of Education.

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PREFACE

The present report describes three experiments, identical in design, in which three methods of teaching certain grammatical structures in English as a foreign language have been compared. Taken together, the three experiments, or part-projects, form the GUME project (Göteborg/Undervisnings/Metod/Engelska = Gothenburg/Teaching/Methods/English). They were carried out during the autumn term of 1968 and the spring term of 1969 in form 7 where the fourteen-year old pupils are in their fourth year of English.

The GUME project is an interdepartmental effort and the people involved represent three different institutions, namely the departments of Educational Research and English at the School of Education and the department of English at the University of Gothenburg. The results of the experiments have already been published in the Swedish report series of the Department of Educational Research, Gothenburg School of Education, and this report is intended to provide information about the research for international readership.

The present report will concentrate on design problems, measuring instruments, statistics and the outcome of the treatment (teaching method) comparisons proper. Anyone interested in "what happened in the classrooms" is referred to the Appendices in which an outline is given of the lessons, especially the oral drills and the explanations offered. There will also be described the "transformational" element utilized in structuring the explanations.

Although the lesson material was constructed by the above mentioned part-project leaders separately, it was written according to agreed guidelines and was subject to continuous exchange of ideas. The planning and execution of the experiments was a joint effort between the part-project leaders and the author who, somewhat pretentiously perhaps, could be called the project coordinator. It is as such that I writing the summary report without having contributed to what made the experiments possible, namely the construction of three parallel series of lessons, representing three different strategies of teaching. Deficiences in this report are my responsibility.

My colleugues and I have often received constructive criticism and invaluable advice from professors Alvar Ellegård and Karl Gustaf Stukát during the course of the project. We wish to thank them.

In the summer of 1968, when the GUME design was being planned, the author had the rare opportunity to discuss research problems in second language learning with professors John B. Carroll and Michael Wertheimer, USA, at the so-called SOLEP conference (Seminar on Learning and the Educational Process) near Stockholm. They cleared my mind on what is worth research and what is not. The ultimate GUME design lacks some of the sophistication they would have imparted to it, but the project had to be a compromise between the ideal and the possible. The friendship and scholarship of Professor Carroll and Professor Wertheimer has been a powerful source of inspiration for me.

Grants from the Board of Education, bureau L 4, have made this project possible, and we should like to express our gratitude for this help. We are also extremely appreciative of the help and courtesy extended by Lumalampan Ltd., Stockholm, in matters concerning the technical arrangements. We are very grateful to Skrivrit Ltd., Stockholm, for permission to use copyright material, to Sveriges Radio for permission to use materials from Skolradio programs and finally to Skolförlaget Gävle for permission to use and adapt material from the "This Way" series of schoolbooks.

Behind the statistics in this report there are more than a thousand pupils, some fifty teachers and their headmasters. We thank them all sincerely for their cooperation.

INTRODUCTION

The origin of the GUME project can be traced back to January, 1967, when Professor Alvar Ellegård, of the English department at the University of Gothenburg, initiated seminars for the discussion of basic language teaching problems. The seminars concentrated on problems of syntax learning, partly because this field is comparatively unexplored and partly because new theories in modern linguistics (mainly Chomsky and his associates) have opened up fresh prospects and given support to old but often neglected theories concerning the learning of languages. The discussions at the seminars may, very roughly, be summarized as follows: two extremes as regards language learning are represented, on one hand by the associationists and on the other by Chomsky (see for instance Chomsky's review of B. F. Skinner's Verbal Behavior in Language, 35, 1959). The associationists maintain that what is being learnt is sequences of words whereas Chomsky's theories make it reasonable to assume that what is learnt is general patterns for sentence production. A child learning to speak produces (generates) sentences that he has not heard before, in other words, he combines words and phrases into new meaningful sentences according to certain rules of which he is, probably, unaware. Although this applies to learning of the mother tongue, attempts have been made to apply the learning - and teaching - principles to second language learning. The associationists stress that second language learning should occur without interference from the mother tongue and that imitation and repetition are of great importance. Chomsky's theory seems to suggest that explicit verbalization of the sentence pattern should have a positive effect on learning. Accordingly one should give the learner concious grammatical insight, an insight that is supposedly facilitated by reference to the mother tongue (contrastive analysis). That explicit verbalization of underlying structures results in better learning is referred to as a fact by Carroll (1966, p. 105): "In learning a skill, it is often the case that concious attention to its critical features and understanding of them will facilitate learning".

The seminar found it worthwhile to check the validity of the contrasting theories. An experiment was contemplated where two teaching methods were to be compared. With one the learners/pupils were to be given explanations and comments (not to be mistaken for grammatical rules in the traditional sense) on structures appearing during the drills. Whith the other the pupils would have systematized drills but with no explicit explanations of either what the drills were about or how the problems should be solved. The drills were to be planned and sequenced in such a way that it would be possible for the pupils to infer "the rule".

During the spring term of 1968 the project team mentioned in the preface was set up. It joined the long-established UME project in Stockholm as a fairly independent cooperative part.

Before presenting the experiment, a few comments on the kind of research that GUME represents may be in order.

The sharp contrast, mentioned above, between theories concerning the optimal method of teaching a foreign language seems to be universal and has given rise to many comparative studies (see for instance the discussion of earlier research in Smith & Berger, 1968, pp. 2-10). An intensive debate has also taken place in Sweden. We shall not go into details here, suffice it to say that the two extremes mentioned earlier seem to have their counterparts in this country. It is interesting to note that when Alvar Ellegård in a Swedish newspaper in January, 1969, advocated a modified grammar-translation method largely based on the cognitive code-learning theory, there appeared a large number of articles, many written by representatives of the Board of Education who defended official methods and criticized Professor Ellegård. It is equally interesting to note that some of those who came out in defence of Ellegård were "stand-pat traditionalists" (Carroll, 1966, p. 95) who had obviously misunderstood him. The Swedish newspaper debate is discussed in some detail in Lindblad, 1969, pp. 27-28. It would not be interpreting falsely to say that it has often been based on little, if any, empirical evidence. "Teacher experience", "traditional pedagogy", etc., have been the authorities quoted as support for one opinion or the other. Teacher experience, subjective as it is, is naturally of the greatest importance as a source of information for the researcher planning an experiment such as GUME. To compare teaching methods and/or variants of them which are comletely at odds with strategies that have traditionally proved to function well, would a priori be a meaningless undertaking. Campbell and Stanley state in their chapter in Gage's Handbook of Research on Teaching (Gage, 1963, p. 174): "Experimentation thus is not in itself viewed as a source of ideas necessarily contradictionary to traditional wisdom. It is rather a refining process superimposed upon the probably valuable cumulations of wise practice. Advocacy of an experimental science of education thus does not imply adopting a position incompatible with traditional wisdom." Since in language teaching - and admittedly also in other fields of teaching - teacher experience is referred to as support for contradictory opinions concerning wise practice, empirical evidence on the problem must be considered important. Or, to quote Campbell and Stanley once more (Gage, op.cit., p. 172): "The experiment is the only means for settling disputes regarding educational practice".

THE PENNSYLVANIA STUDY

In the present report no extensive review of relevant research will be given. We shall, however, comment in some detail on the recently completed Pennsylvania Study or Project 1330 (Smith & Berger, 1966, and Smith & Baranyi, 1968) since it is an experiment on a very large scale within the same problem area investigated by GUME.

On March 1st, 1965, The Pennsylvania Foreign Language Research Project was established at West Chester, the largest of the Pennsylvania State Colleges. The main objects of the study were to determine which of three foreign language teaching strategies was most effective and to determine which of three language laboratory systems was best suited, economically and instructionally. A number of secondary objects were listed as well, and we shall return to these presently. Without exaggeration the investment in people and money was enormous and very probably Project 1330 will become a classic within the area of comparative research. As Rebecca Valette (1968) has pointed out the results of the first part of the project pointed to conclusions other than those which many teachers had expected, which means that the project will be analyzed with a fine-tooth-coomb to uncover flaws in the design and weaknesses in the execution of the project. Since the GUME project team had access to the first Pennsylvania report when planning their own project and could thus profit from recent experiences made there, we think it is of special interest to discuss Project 1330 at some length.

The authors (Smith & Berger, op.cit., p. 10) end their survey of related research by stating: "By 1964 no sufficiently realistic and generalizable research had been undertaken to shed light on specific questions on modern foreign language instruction facing the American secondary school: which strategy or laboratory system works best when translated from a specific local small scale setting into the larger reality of numerous secondary schools?" (J.B. Carroll, reviewing nearly the same volume of research in Gage´s Handbook of Research on Teaching, p. 1094, dismisses most of the projects as being "poorly controlled or otherwise deficient from the standpoint of valid research methodology").

The three teaching strategies being compared in Project 1330 were:

TLM	Traditional Method
FSM	Functional Skills Method
FSG	Functional Skills + Grammar

The intact school class was the experimental unit. Class assignment was random only across the two functional skills methods. In the case of TLM, only teachers who had expressed a preference for that strategy were assigned to it. The assignment procudure is thus a potential source of error since it is possible that teacher preference reflect belief in the strategy, which will breed more enthusiasm for the work and hence encourage better results.

The objectives and characteristics of the three teaching strategies were defined by a select panel of modern foreign language educators, among them Robert Lado, Stanley Sapon and Albert Valdman. The traditional method is very traditional, at least according to Swedish standards, which is demonstrated by part of the description of TLM (op.cit., p. 19): "Use of native tongue in the classroom predomiant. Target language not to be used for purposes of communicating instructions or information to students .....

Grammar:

1. Analysis before application.
2. Language organized into word lists, paradigms, principal parts, rules.
3. Analysis in depth of grammatical structures ..... General orientation of traditional program is academic and intellectual".

FSM corresponds to a rather pure direct method (op.cit., p. 21): "The functional skills are taught by means of the dialogue and its associated activities. There is opportunity for extensive student practice in both listening and speaking in the target language. Vocabulary is learned only in context while formal prescribed grammatical analysis is avoided." In the "list of criteria" describing FSG it is difficult to detect what distinguishes it from FSM. The only difference we have found which could provide sufficient stimuli for the teacher to behave differently is the following (op.cit., p. 23): "Pattern drills are supplemented by explicit instruction in the appropriate grammar." Considering this diffuse difference between FSM and FSG one might venture to say that the experiment is in reality a comparison between one very traditional and *one* audiolingual teaching method.

Analogously three laboratory systems were defined by the above mentioned panel:

TR	Tape recorder	Tape recorder only, i.e. the simplest audio aid in foreign language teaching. In Project 1330 it represented "the minimum baseline or control strategy" (op.cit. p. 25).
AA	Audio-Active	Each pupil equipped with a microphone, amplifier and headset. Usually there is more than one tape recorder or other program source at the teacher console, which is wired for monitoring individual student performance.
AAR	Audio-Active-Record	Beside the equipment in AA the pupil also has recording facilities. Principally, the pupil records the instructor´s and his own responses and then compares them during playback.

Both German and French classes were included in the study but only beginners in the respective language were concerned. Pupils in grade 8, 9, 10 and 11 made up the experimental population, which enabled an investigation of the optimal age to start second language learning (within the age limits given). The experiment was planned as a four year follow up. The pupils were, compared to Swedish circumstances, a very select group since only 17-20% take a foreign language in Pennsylvania. (In Sweden all children from the age of 10 have to take English; from 1970 all children will have to start English from the age of 9.) It is also apparent from the IQs, 113,5 for the French and 115,1 for the German group, that the Pennsylvania children were a select group. The original (=first year´s) population consisted of 104 school classes (61 French, 43 German) from nearly as many schools, representing a great geographical variation in the state of Pennsylvania. The teachers were all willing to participate in the experiment. Each one had at his disposal a detailed instruction covering "his" teaching strategy and/or laboratory treatment and also attended periodic workshops. A most important control of the teacher variable was exercised by so called field consultants who were expected to visit each project classroom about twice a month, discuss the teacher´s experiences and advise teachers and administrators of forthcoming project activities. "Teachers deviating markedly (italics mine) from the assigned strategy-system were dropped from that assignment and from the project" (op.cit. p. 30).

This kind of control of independent variables by means of field consultants must alone have cost a considerable amount. No special course material was constructed (!) but the teachers were free to choose one out of five (French) or one out of four (German) textbooks. A minimum pensum to be covered per time unit was established (if a class did not manage to cover this pensum it was cancelled from the statistical computations). On the other hand no maximum pensum was established; thus different classes could (and did!) cover different amounts of text.

The pupils were tested extensively three times a year (pre-, mid- and post-year). The tests used were the California Short-Form Test of Mental Maturity, the Modern Language Aptitude Test, various sub-tests of the MLA Cooperative Foreign Language Tests and a Student Opinion Scale. The teachers received the MLA Foreign Language Proficiency Test for Teachers and Advanced Students and their attitudes to their teaching strategy were assessed both before and after assignment by means of semantic differential opinion scales.

Teaching strategies and laboratory systems were combined according to "The Factorial Design"(two factors) discussed in Lindquist (1953). The statistical techniques used when comparing treatments (strategies and lab systems) were mainly analysis of variance and covariance. The results at the end of the first year are indicated below (op.cit., p. IX) where some of the secondary objectives not mentioned earlier are also apparent:

1. "Traditional" students exceeded or equalled "Functional Skills" students on all measures.
2. The language laboratory systems as employed twice weekly had no discernible effect.
3. There was no "optimum" combination of strategy and system.
4. The best combination of predictors of success were the MLA Cooperative Classroom Listening Test, the Modern Language-Aptitude Test and Language IQ as measured by the California Test of Mental Maturity (Short Form).
5. Females did better than males.
6. Student attitude was independent of the strategy employed.
7. "Functional skills "classes proceeded more slowly than "Traditional" classes.

8. There was no relationship between teacher scores on all seven portions of the MLA Teacher Proficiency Tests and the achievement of their classes in foreign language skills.

Of the original 104 classes, 61 remained in the study throughout the second year of instruction. Major conclusions after the second year were (Smith & Baranyi, 1968, p. VII - VIII):

1. No significant differences existed among strategies on all skills except reading (TLM >) as measured by contemporary standardized tests after two years.
2. The language laboratory of any type, used twice weekly, had no discernible effect on achievement.
3. The best over-all predictors of success in a second language were prior academic success and a modern language aptitude test.
4. Student opinion of foreign language study inclined to the negative throughout instruction, independent of the teaching strategy employed.
5. Existing test norms were more than most of the experimental population achieved.
6. Within the functional skills strategies students utilizing Holt, Rinehart and Winston materials did significantly better than students using the Audio-Lingual materials.
7. Neither teacher experience in years and graduate education nor scores on the MLA Teacher Proficiency Tests were related to mean class achievement after either one or two years.

During the third year only 12 classes participated. At the moment there is only a preliminary report available and we shall not discuss the third-year study here.

At the end of the first year the superiority of TLM was largest and statistically significant at the MLA Cooperative Tests (reading, vocabulary, grammar, total). On other post-experimental tests TLM either equalled the other strategies or surpassed them, though not significantly. What is noticeable about the MLA Cooperative Tests (reading, vocabulary, grammar) is that they consisted of an outdated version (1939-41) that had been reprinted for the purposes of the study. A hasty glance at the description of the tests makes it clear that they have an academic orientation that obviously puts TLM at an advantage. During the second year of instruction the 1939-41 versions were replaced by modern variants, and the differences between TLM and FSM/FSG consequently (?) vanished. Considering the type of measuring instruments used in the study the results become almost self-evident and suggest that, in spite of all "lists of criteria", the instructional objectives had not been defined concretely enough, nor had test items been constructed which corresponded to defined objectives. The use of the 1939-41 version of the Cooperative Tests was perhaps intended to give the Traditional method "a fair chance".

As Valdman (1969) has pointed out the mentioned lists of criteria were vague and imprecise and must have been of very limited value for the teachers as instructional guidelines. Once more we would stress that differences between FSM and FSG are difficult to detect even on a careful reading of the two lists item by item. The most essential difference between TLM and the two functional skills methods is the role of grammar. In TLM knowledge of grammatical rules is considered necessary to control the behaviour governed by those rules, whereas in FSM and FSG grammatical rules are regarded as "incidental". No rules were given in FSG, but "extreme care is exercised to limit the grammar to clarifying the pattern which was practised during the dialogue" (Smith & Berger, 1968, p. 23). The distinction between giving rules and clarifying a pattern is perhaps not as clear as it may seem.

As was pointed out earlier the teachers could choose between four or five text books or materials. Although it was argued that the situation approximated the real school setting where a large number of materials were available, this is extremely dissatisfactory from an experimental point of view. (A check showed that within the school districts involved in the study, twenty-seven different sets of texts and instructional materials were utilized). Furthermore there were no restrictions on how much text could be covered per time unit. Thus text materials chosen as well as rate of progress are possible sources of variation in Project 1330. During the first year, progress in the Traditional classes was almost three times (!) as great as in the functional skills classes. Above that the TLM text material was found to contain a larger vocabulary. Rebecca Valette (1969) has shown that even the more modern variants of the MLA Cooperative Tests demand a considerable range of vocabulary; thus it is not surprising that TLM should surpass the functional skills methods.

One possible explanation of the considerably faster rate of progress in TLM could be the fact that those classes only had teachers who sympathized with the method .

The Pennsylvania experiment illustrates the difficulties involved in controlling the many variables at work in a broad study of this kind. We feel that the results should be interpreted with caution, and certainly so in respect of the first year's study where the Traditional teaching strategy appeared to be dramatically superior. Project 1330 has initiated a lively debate on foreign language teaching practice and perhaps also fostered a more balanced view on the alleged superiority of a certain teaching method. The lists of recommendations included at the end of both the Pennsylvania reports will be of great value to researchers penetrating the same or related fields in the future.

As has been mentioned the GUME project team had the advantage of planning their study with the first Pennsylvania report available. Although GUME is an experiment on a smaller scale and in logistic matters should not be compared to Project 1330, its main objectives and experimental design are similar. Direct similarities and differences, in so far as they can be judged as interesting, will appear on a comparative reading of the respective reports. In our opinion a most essential difference is the much stricter control of the stimulus (teaching) situation that was achieved in GUME by the elimination of one source of error, namely the variation in teacher behaviour.

THE GUME PROJECT

Objectives

The main objective of the study has been indicated in the preface and introduction. However, it can be said to consist of four objectives, here stated in order of importance:

1. to investigate what effects theoretical explanations in juxtaposition to purely structural drills may have on learning
2. to compare learning effects when explanations are offered in the source language (Swedish) with learning effects when explanations are given in the target language (English)
3. to produce diagnostic and prognostic tests
4. to a limited extent to produce some educational material in a preliminary version.

In the main the present report will deal with point 1 and 2.

Specific objectives of the three part-projects

The GUME project was never meant to be a full-scale experiment working with the complete range of language aquisition but it was to have a limited objective, that of trying to establish how specific grammatical patterns are learnt and should best be taught. Accordingly, three areas within English syntax, which are known to cause Swedish pupils great trouble, were chosen for investigation. The distribution of grammatical problems among the three part-projects is as follows:

GUME 1	The do-construction
GUME 2	The some/any dichotomy
GUME 3	The passive voice

The three part-projects follow the same design (se below). Ideally the three experiments should be identical except for the choice of syntactic problem. In reality, it is, of course, hazardous to make any statement on the degree of similarity between teaching procedures in the three projects. Although the coordination and constant exchange of ideas between the program constructors is a certain guarantee that the same didactic principles have been applied, it could be that one project became more oriented towards transformational grammar than the others. (Concerning the application of Chomsky's theories in practice, see Lindblad, 1969, p. 51-53). However, we assume that the projects are comparable in this respect and therefore regard them as a cross-validation within the total experiment.

The three methods

The Implicit method. The pupils have systematized drills and structural exercises but no analysis or explanation of either what the drills are about or how the problems should be solved. The method corresponds to what in American terminology is called the audiolingual method and - although this is irrelevant - could also be fitted into the official Swedish curriculum (Läroplan för grundskolan). We also think that the Implicit method represents a rather extreme direct method that many teachers in this country, rightly or wrongly, would consider in line with the instructions of the Swedish Board of Education.

The Explicit-English method. The pupils have systematized drills and structural exercises and in addition analysis and explanations in English. The time allotted to explanations is taken from the drills and exercises.

The Explicit-Swedish method. The pupils have systematized drills and structural exercises and in addition analysis and explanations in Swedish whereby comparisons are made with corresponding structures in the mother tongue. The time allotted to explanations is taken from the drills and exercises.

Henceforth the three methods will be abbreviated:

Im
Ee
Es

The above descriptions of Im, Ee and Es do not meet the demands on a strict taxonomy of educational objectives but rather indicate the main characteristics of the three methods. The guidelines followed at the construction of the three lesson series have not yet been incorporated into any taxonomical description; for the present the descriptions of the lessons (see the Appendices) form the operational definitions of the methods.

Pupil sample

54 school classes within Gothenburg, for the most part, and Mölndal, a small town bordering on Gothenburg, were equally divided between the three projects. Of the 18 classes in each part-project 12 take a more advanced course (= "särskild kurs") and 6 an easier course (= "allmän kurs"). These will henceforth be abbreviated Sk and Ak. The classes chosen represent considerable geographic variation within the Gothenburg area. Thus GUME 1 utilized classes from the western and central parts of Gothenburg, GUME 2 classes from the central and northern parts and GUME 3 classes from the north-western and eastern parts and Mölndal. Within each project the classes were randomly assigned to teaching strategies (Im/Ee/Es). One restriction was imposed on the random assignment: the same strategy could not be used in two classes in the same school. For logistic reasons it would have been preferable to use three classes at each school. This would have limited the number of schools and meant less travelling. For the simple reason, however, that in a large number of schools all class 7's have English at the same time, a larger sample of schools than was judged necessary was included.

Table 1. Distribution of school classes per part-project, course and teaching strategy

	GUME 1 (The do-construction)			GUME 2 (Some/any)			GUME 3 (The Passives)		
	Im	Ee	Es	Im	Ee	Es	Im	Ee	Es
Sk	4	4	4	4	4	4	4	4	4
Ak	2	2	2	2	2	2	2	2	2
Total	6	6	6	6	6	6	6	6	6

The ratio of Sk/Ak classes was intended to correspond to the actual proportion of pupils taking the two courses. During the 1968/69 school year 67.8% were taking the Sk and 32.2% the Ak in Gothenburg. As it turned out in the GUME project the Sk classes consistently contained a larger number of pupils than did the Ak classes. Thus there is a slight over-representation of Sk pupils in the GUME sample as can be seen in the table below.

Table 2. Number of pupils per part-project and % per course

	GUME 1	GUME 2	GUME 3	Total
N	356	318	337	1.011
% Sk	69.9	72.6	73.3	71.9
% Ak	30.1	27.4	26.7	28.1

It should be mentioned that the numbers given in the table refer to the number of pupils for whom data were processed. The total sample also contained pupils who were dropped from the statistical computations for reasons that will be given later.

Experimental procedure.

The various measuring instruments used in the study will be discussed presently. This section is only intended to give a short description of the experimental sequence.

The treatment, that is the teaching strategy that the pupils were exposed to, consisted of six lessons. In the 7th form of the Swedish schools the pupils have four hours of English a week. Very often two of these follow one upon the other. Since it was felt that the pupils should not have more than one lesson in the project per day, there were in most cases three hours per week that could be used. The lesson series was preceded by a pretest and a "pre-teaching period" and followed by a posttest, an attitude test and (approximately one month later) a retest Interspersed in the treatment sequence - the three projects varied slightly as to the exact time - were an IQ test and a comprehension test (PACT). The plan for a part project would thus cover about four weeks; see fig. 1 on page 17.

Fig. 1. Theoretical plan for each of the three part projects

1st week	Pretest	Pre-teach. Period 1)	X	Lesson 1
2nd week	Lesson 2	Lesson 3	IQ Test	Lesson 4
3rd week	Lesson 5	Lesson 6	IQ Test PACT	Post-test
4th week	Attitude Test			
– – –				
9th week	Retest			

1) Pre-teaching period = A short lesson aimed at teaching the pupils how to handle the earphones and how to do the oral 4-phase drills, and also intended as a test of the equipment.

X = Lesson during which the ordinary teacher taught the class and was allowed to do whatever he liked as long as he did not touch on the problems dealt with in the project.

Note: Two lessons were never given on the same day to the same pupils. The IQ tests were quite often given on two separate occasions. Because of holidays the project, in most classes, took a little more than four weeks to finish.

The lessons

Each teaching strategy within each part project consisted of 6 lessons, each lesson lasting 30 minutes. In the explicit classes explanations and analysis took 9 minutes per lesson. As was mentioned earlier, this time was taken from the drills.

Each lesson consisted of three parts: oral grammar drill, written practice on the same structure and a reading passage containing a fairly large number of examples of the same grammatical structure. The duration of each of these activities was approximately 10 minutes. Sometimes they were mixed but the same balance was kept. (See the Appendices for a detailed account of the distribution of activities per lesson.)

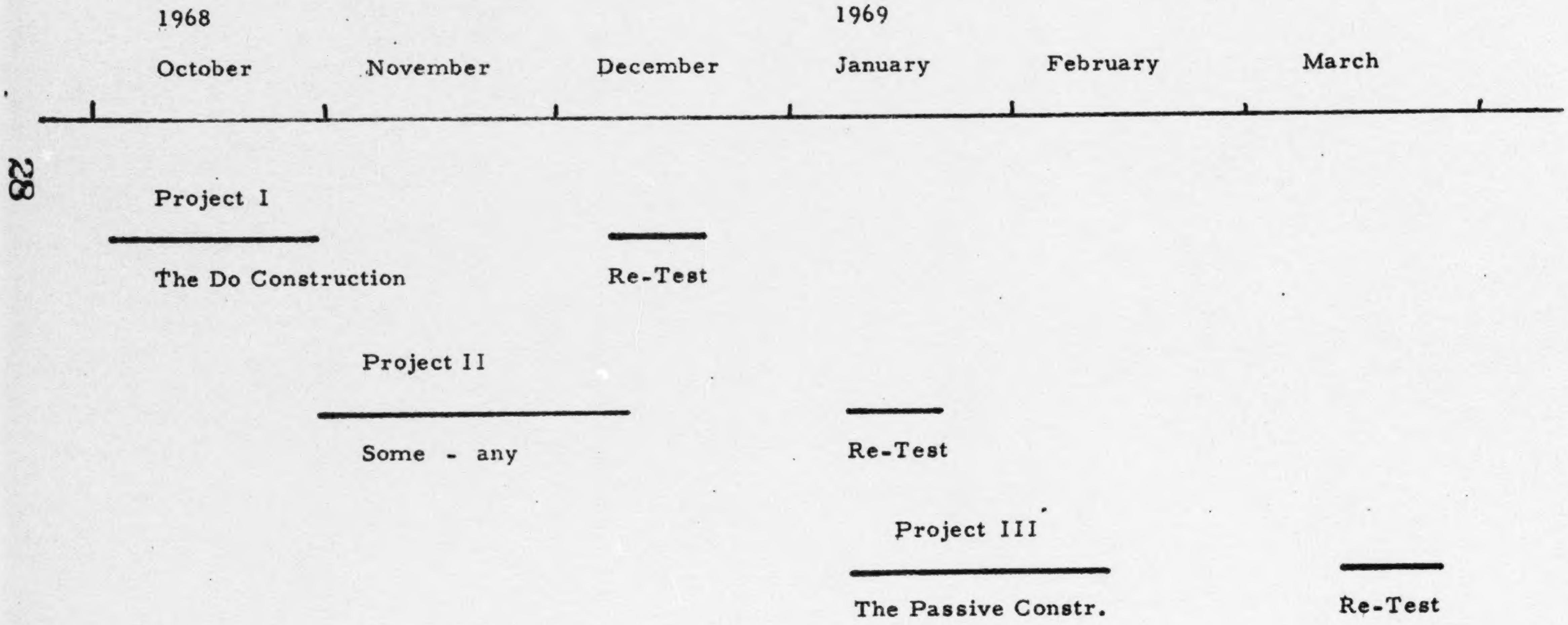
In order to eliminate the teacher variable the lessons were recorded on tape. The pupils listened to the "canned" lessons using audio-active headsets with induction receivers. In the ordinary classrooms telephone wires had been installed to create a magnetic field. This arrangement, a simple sort of language lab., could also be supposed to ensure concentration and activity.

Three assistants provided the instruction and transported the necessary material (headsets, tape-recorders, projectors, teaching equipment). The assistants were university students without teaching experience and their sole function was to start the tape and hand out the booklets containing the lesson material. They did not intervene in the actual instruction, nor did the regular teachers, who were present purely as observers and the guardians of law and order in the classroom.

Time table for the GUME project

The first part project got under way early in October, 1968, the third project was finished in late March, 1969. A survey of the three projects is found in fig. 2 on the next page.

Fig. 2. Time-table for the three part projects of the GUME project 1968/69



Measuring instruments

The achievement test. An achievement test in English was constructed separately in each of the part-projects. Since one of the aims of the study was to try out various types of proficiency tests in the foreign language, the results of that work (intercorrelations between items, correlations between sub-tests, validity data) have been discussed in detail in the three part-project reports (Lindblad 1969, Carlsson 1969, Olsson 1969). The present report will only include a short statistical description of the final version of the tests. As was mentioned earlier, the achievement test was administered three times, as pre-, post- and re test.

The achievement tests measured what had been taught during the six lessons, i.e. various aspects of a particular grammatical structure. The tests do not claim to be comprehensive as regards linguistic components (phonology, lexis, etc). nor as regards dimensions of behaviour (listening, speaking, reading, writing). Thus no test of oral production has been given, and tests of listening comprehension were only given to a limited extent. For administrative reasons the tests mainly consisted of items with set response alternatives (two-, four- and six-choice) and completion items where the students filled in one or two words. It was decided that the test should take one lesson maximally to administer. However, the leader of GUME 3 wished to include translation items as well and therefore to have two lessons at disposal for the test. Thus the achievement test in GUME 3 came to consist of one part with set response alternatives and one part with translation items (Swedish to English) and transformation items (actives to passives and vice versa). Part 1 and 2 of the tests were not administered on the same day which caused some additional drop-outs (a pupil who was not present on both occasions was eliminated from the data processing). The following table illustrates some of the characteristics of the tests:

Table 3. Statistical description of the three achievement tests

	Number of subtests	Max. score	Adm. time	Reliability (split-half)		
				Sk+Ak	Sk	Ak
GUME 1	12	120	1 lesson	.92	.88	.92
GUME 2	3	131	1 lesson	.92	.90	.93
GUME 3	7	133	2 lessons	.91	.92	.72

The reliability coefficients are more than satisfactory for the purposes of the investigation (comparisons between groups). I all cases they have been estimated on the pretest. In the case of GUME 3 the reliabilities refer to sub-tests 1-4 (corresponding to part 1 with set response alternatives).

The intelligence test. Three parts of the so-called DBA-test (DBA = differentiell begåvningsanalys, i.e. differential intelligence analysis) constructed by Professor Härnqvist of the University of Gothenburg were used. They were the verbal, inductive and spatial parts which, taken together, are considered to be a reliable measure of general ability or scholastic aptitude (see further Härnqvist, Manual till DBA). The sum of the pupils´three stanine scores were transformed to T-scores (mean: 50, standard deviation: 10).

PACT

Pictorial Auditory Comprehension Test is a listening comprehension test that has been constructed by John B. Carroll and one of his assistants, Wai-Ching Ho. The test is supposed to measure foreigners´comprehension of spoken English. The subject (pupil) listens to a taped conversation or description of an object or event, etc., and then marks which of four pictures corresponds to what was said on the tape. The test consists of 75 items. The author recived permission from Professor Carroll to try out the test on Swedish groups. An native Englishman made the recording and all the instructions were modified to suit the age group in question (7th form, 14 years).

PACT will not be directly utilized in the evaluation of the experiment although in might have been included as a covariate in the analyses of covariance. As already mentioned, one of the aims of the GUME study was to construct new tests of English, and PACT should therefore, be regarded as a contribution. A more detailed discussion of PACT has been given in the GUME 2 and GUME 3 reports.

The attitude test

The students were asked questions with set alternatives as well as some questions with open answers. Four of the questions with set alternatives concerned the pupils´general attitude towards the experiment (5-point scale) and five questions measured their views on technical and pedagogical aspects (4-point scale). A maximally positive attitude would yield a score of 40 on the questionnaire. The open answers, which incidentally covered a wide range from extremely positive to extremely negative or even slightly abusive, will not be commented on further in this report.

Social class

Information about the parents´ occupation was collected at the headmasters´ offices. The criterion for assigning a pupil to a particular social class was a hierarchical description of professions and occupations from 1958 (1958 års valstatistik), which is to some extent arbitrary and even inconsistent, but it is the only source available at the moment. Social class 1 corresponds roughly to English "upper middle class", and class 3 to "working class"; the much-disputed division is based on income only.

Grades

Grades in English, Swedish and Mathematics were collected. The grades had been given at the end of the preceding year, i.e. at the end of the 6th form. At that time the pupils were not streamed into different courses but kept together in the same class. The particular advantage in this connection is that they then constituted one single reference group as far as grades are concerned. The grades are expressed on a 5-point scale (mean: 3, standard deviation: 1). The three grades were added together whereby a scale with a standard deviation of 3 was obtained. Since grades and IQ were to have the same weight in the statistical analyses, the grade score was multiplied by 3. The Grades scale, thus obtained, had a mean of 27 and a standard deviation of 9.

The statistical program

All the data were processed at Göteborgs Datacentral för Forskning och Högre Utbildning, GUME 1 and GUME 2 by computer IBM 360/50 and GUME 3 by the recently installed IBM 360/65. Analysis of variance and covariance programs included in the ISR (Institute for Social Research, University of Michigan) and BMD (Bio-Medical Computer Programs, UCLA) series were used.

In the main, identical computations were made within the three part projects. There are minor differences as will appear from the presentation. The following measures or analyses were obtained in each of the projects:

a) means and standard deviations for all variables. Data were obtained for the total population, for Sk and Ak separately, for boys and girls separately and for each participating school class (18 per part-project).

b) correlations between all variables. Data were obtained for the total population and for Sk and Ak separately.

c) analyses of variance (one-way), where the experimental population was divided into three levels of intellectual ability

d) analyses of variance (two-way) with the same division of the population as in c)

e) analyses of covariance with different covariates and dependent variables.

Any student who did not attend 5 or 6 lessons was eliminated from the data processing. These "drop-outs", i.e. the students attending only 1-4 lessons, have been investigated separately, and will be commented on later. Within each experimental population the N´s vary somewhat from variable to variable due to stray absences.

Experimental design

The design used corresponds to Campbell and Stanley´s "design 10", The Non-equivalent Control Group Design (Gage, N. L., op.cit., p. 217). For administrative reasons intact school classes had to be used in the experiment. It has thus not been possible to assign the students randomly to teaching strategies (treatments). In the absence of experimental control of background (concomitant) variables, statistical control by analysis of covariance has been resorted to. Analyses of variance have also been performed. The principles underlying the two types of calculations will be given below.

1. Comparisons between Sk and Ak. As a measure of progress made during the experiment, the pupil´s score on the posttest minus his score on the pretest has been used. This progress-score is henceforth abbreviated P 1. To find out if the pupil´s progress, if any, was not only apparent immediately after the experiment but also remained apparent after some period of time, a retention score (P 2) was analogously calculated (Retest - Pretest). In the analyses of covariance, P 1 and P 2 have made up the dependent variables. In both cases a composite Grades + IQ score has been used as covariate (concerning Grades + IQ, see page 22. Although the correlation between the composite Grades

+ IQ scores and achievement scores should be substantial, it is very probable that the correlation between the Grades + IQ scores and progress scores is considerably lower (Anastasi, 1958). If this is the case, the gain in precision with analys of covariance, as compared to analysis of variance, will be negligible. The analyses of covariance in the present study were performed at a time when these correlations were not known,

In addition two analyses of covariance were made with the Pretest as covariate and the Posttest and Retest as dependent variables, respectively. All analyses were performed for Sk and Ak separetely. The following table is a survey of the calculations made.

Table 4. Analyses of covariance

Course type	Covariate	Dependent variable
Sk	Grades + IQ	P 1
Sk	Grades + IQ	P 2
Sk	Pretest	Posttest
Sk	Pretest	Retest
Ak	Grades + IQ	P 1
Ak	Grades + IQ	P 2
Ak	Pretest	Posttest
Ak	Pretest	Retest

The adjoining analyses were identical in GUME 1, 2 and 3. Thus a total of 24 analyses of covariance were performed.

2. Comparisons between ability levels. As was stated earlier, the pupil's ability level is defined by his composite Grades + IQ score. The pupils were divided into three ability levels; it should be stressed that this division was made after the experiment had been completed, which explains that the three groups were not distributed absolutely equally among the teaching strategies. The variation in number between the different cells will be apparent in the results section. The three groups were established thus:

U = Upper level = the upper third on the Grades + IQ scale
M = Middle level = the middle third - " -
L = Lower level = the lower third - " -

As became apparent from the distributions of IQ scores in the three part-projects the streaming in form 7 of pupils into two courses, Sk and Ak, is not optimal with regard to IQ (= general scholastic ability). This is to say that the overlap in IQ between the more advanced and the easier course is large indeed. English is the only subject where streaming is still in existence in the comprehensive school in Sweden. Against the background of the much-disputed streaming policy in the subject of English, the above-mentioned partitioning of pupils into ability levels was judged interesting.

For each of the dependent variables investigated, three one-way analyses of variance have been performed according to the following schematic table:

	Im	Ee	Es
U			
M			
L			

The table below illustrates the analyses that the three part-projects had in common:

Table 5. Analyses of variance (one-way)

Ability level	Dependent variable
U	P 1
U	P 2
U	Posttest
U	Retest
M	P 1
M	P 2
M	Posttest
M	Retest
L	P 1
L	P 2
L	Posttest
L	Retest

The adjoining analyses were identical in GUME 1, 2 and 3. Thus a total of 36 analyses of variance (one-way) were performed.

In addition two analyses of variance were performed which were not common to the three projects. The difference score (P 2 - P 1) was calculated in GUME 1. If this value was positive the implication is that the pupils´ knowledge of the specific grammatical structure has increased from Posttest to Retest despite the fact that no instruction was given in the meantime (approximately 1 month). An eventual increase from Post- to Retest might perhaps be termed a reminiscence effect. What is interesting in our case is, of course, if this effect were different among the teaching strategies.

In GUME 2 there was an investigation of what might be called "critical items" (CI). These items were intended to measure such knowledge as could be hypothesized to conflict with "rules" given before the experiment. Examples: 1. He plays better than anybody else. 2. Why don´t you do something about it? It could be supposed that the pupil considers somebody to be correct in the first sentence because it is a statement and not a question, etc. The "critical items" were rather few in number but still considered worthwhile investigating.

Since it can be hypothesized that one particular teaching method has a facilitating effect at one particular ability level and not at another, the interaction between teaching method and ability level was investigated. Analyses of variance, two-way classification, were performed with Progress I and Posttest as dependent variables. The data were organized in a 3 x 3 table in each analysis:

	Im	Ee	Es
Upper			
Middle			
Lower			

METHOD PROBLEMS IN COMPARATIVE RESEARCH

A. GUME as a research project - some comments

In his chapter "Research on Teaching Foreign Languages" in Gage's Handbook (Gage, N. L., pp. 1060 ff), John B. Carroll dwells on the specific advantages and problems inherent in research on foreign language teaching. We will discuss at some length the issues that we consider relevant to the GUME project.

When a student begins to study a foreign language, he usually starts something entirely new. From a research point of view this is a great advantage because a natural "zero-point" is given. This at least theoretical advantage, pointed out by Carroll, is not relevant to the GUME project since the students were in their fourth year of English. It is reasonable to assume, and it is also confirmed in an investigation within the UME project ("Elevers engelska ordförråd vid slutet av årskurs 7 = English vocabulary of pupils at the end of the 7th form", UME report, December, 1967) that the variation among pupils as regards proficiency in English is large. This variation is controlled statistically in the GUME project by analysis of covariance (to the extent that this variation is measured by our tests). One might venture the guess, however, that in a comparative study such as the present one, where the pupils have had three years' teaching before they start the experiment, the amount of treatment (teaching) within the experiment must be fairly large if differences between treatment effects are to be detected. In the GUME project the treatment (teaching) proper consisted of 6 lessons (excluding the preparatory lesson), which might be judged as very little, but it was what resources permitted. In order to counterbalance the shortage of time we chose to make the teaching strategies distinctly contrastive and, in certain respects, extreme. Thus the students were given explanations for 9 minutes (out of 30) each lesson, which is more than any teacher would consider optimal. Against the background of the short lesson series it was considered necessary to give the treatment variable, (the explanations) emphasis by giving it a disproportionately long time each lesson. Although this procedure is defensible in an exploratory study such as the present, the aim of which is to investigate whether explanations have any positive effects at all, problems will arise in generalizing the results to the ordinary classroom situation.

As a particular advantage in research on teaching foreign languages Carroll states that the stimuli presented to the students could be controlled to a very high degree. "The instruction could be programmed to the last detail". This was the case in our experiment, as has been said earlier.

Carroll also points out that in research of this kind reliable and valid tests of achievement and intellectual ability are often available. The GUME project did make use of an intelligence test (DBA) that has proved satisfactory in these respects (Härnqvist, 1960). One of the objectives of the study was to construct tests of achievement in English. This was done in all three part projects, and the result of this work has been accounted for in the separate reports.

Carroll also treats a very general problem in connection with research on foreign language teaching, a problem that we have already touched on. When a teaching method is broken down into components that lend themselves to experimentation - for example, use of the source language as opposed to the target language for explanations - one is often compelled to modify the components somewhat in order to make the teaching process optimal. In the GUME project the difference between the Ee- and Es-variants is thus not only a difference in language of instruction; in the case of Es the explanations are given in Swedish and comparisons with Swedish structures are made. Even if this is a complication from an experimental point of view (if Es $>$ Ee, is this due to the use of Swedish per se or is it due to the fact that comparisons with corresponding structures in the source language facilitate learning?), we have regarded it as relatively harmless. One further modification of this kind are the words, translated into Swedish, that appear in the margin of some of the reading texts. Although the Im- and Ee-variants per definition should not make use of Swedish, we have considered it necessary to translate words that we could presume to be unknown to the students in order not to inhibit their reading unnecessarily. Carroll makes the following comment in connection with this type of problem (Gage, N. L., p. 1064): "It is difficult, then, to vary one element of instruction experimentally without modifying the effect of other elements. The experimental control of a single variable, if carried out in connection with classroom instruction, may entail the revision of an entire textbook or series of tape recordings". In the GUME project it was felt necessary to devise "from scratch" three parallel series of lessons for the purposes of the experiment.

Our study is probably rather close to what Carroll calls .... "miniature language settings in which the objectives of instruction are limited and variables can be carefully controlled." One problem connected with this type of research, where lesson series have been constructed for experimental purposes, is that the teaching procedures might become so artificial that they cannot be transferred to the ordinary classroom. The reader is referred to the Appendices to form an opinion on the value of the lessons as a teaching routine.

Among other problems that Carroll discusses is the practical and technical complexity of research utilizing electronic aids. The wires that were installed in the classrooms and the headsets with induction receivers that the student used, can be said to have functioned well. A first set of earphones displayed shortcomings during the project and had to be replaced by others. This was carried out smoothly.

B. Hypothetical treatment effects

The present investigation implies a comparison between three teaching strategies. No assumptions are made about the superiority of any one method; to use a different terminology, the null hypothesis is being tested. The experimental design should be such as to make interpretations of the results as clearcut as possible. Of all the theoretically possible outcomes, some are more difficult to interpret than others. In this section we will briefly discuss specific interpretation problems that may arise.

The three teaching strategies being compared are

Im Ee Es

On the one hand the effect of explanations is compared with the effect of non-explanations, on the other one method utilizing the source language (Swedish) is compared with two methods utilizing the target language (English). An ideal design for isolating the effects of explanations/non-explanations, source language/target language would have to include an Im_s, i.e. Im-Swedish, variant. However, since such a method is impossible per definition, and, accordingly, could not be included in the design, the interpretation problems indicated above will arise in certain cases.

When comparing three strategies, the following main results are possible:

a) two methods equal and better than the third (3 possibilities)
b) one method better than the two others, they being equal (3 possibilities)
c) method X better than method Y better than method Z (6 possibilities)
d) the three methods equal.

According to a) above, the following three outcomes are possible in the GUME project:

1. Ee = Es > Im
2. Im = Ee > Es
3. Im = Es > Ee (?)

In case 1 the facilitative learning effect is unequivocally due to the explanations, in case 2 to the use of English, whereas in case 3 the result could not be logically explained. The superiority of methods Im and Es can be accounted for neither by reference to language of instruction nor by explanations.

Correspondingly there are three possible outcomes according to b) above.

4. Im > Ee = Es
5. Es > Ee = Im
6. Ee > Im = Es (?)

In case 4 the non-explanation method is unequivocally better than the two explanation methods, in case 5 the facilitative effect can be traced to the use of the source language, whereas in case 6 the outcome is impossible to interpret. According to c) above, six results, approximately identical to the six just presented, are theoretically possible. Our intentation here is only to predict difficulties of interpretation in general, and we will not discuss interpretation problems under c) further. Concerning d) (the three methods equal) it should be remembered that such an outcome does not prove that there exist no differences between the methods (as is well known it is a logical impossibility to prove the null hypothesis). One possible explanation might be that the experiment, as it was planned and executed, did not succeed in detecting actually existing differences between the methods.

To sum up: The experiment makes possible comparisons between three methods of instruction. Theoretically thirteen different outcomes are possible. Some of them would be impossible to explain, or rather, would arouse doubts about the experiment, notably the experimental control of the three teaching strategies. We may get a good reason for returning to the interpretation problem in the results section.

RESULTS

Statistical description of the experimental population

In order to make possible comparisons between the three student pupulations included in the total experiment, descriptive statistics are given in the same table for all variables used in the three projects (table 6, page 33). In the tables to be presented in this chapter, the variables have been divided into two groups, identical and non-identical, i.e. variables that the three GUME projects have in common and variables used only in one or two of the part projects. It should be noted that the tables only include pupils who were present during at least 5 out of 6 lessons. The others (the drop outs) will be presented in the next section.

Means and standard deviations have been calculated for the entire group (Sk + Ak), for Sk and Ak separately, for boys and girls separately and finally for each separate school class. The latter will not be dealt with in this report.

As can be seen in table 6, there is a great similarity between the three GUME populations as regards Grades and IQ, the latter defined by the verbal, inductive and spatial factors. There are no statistically significant differences between the three populations in Grades, IQ or Grades + IQ, i.e. the tree variables to be used as covariates in the treatment comparisons. The reason for not including data on PACT in GUME 1 is that a preliminary version of the test was used where instructions, timing, etc., were tried out. The difference between GUME 2 and GUME 3 on PACT (GUME 3 $>$) is statistically significant at the 5% level.

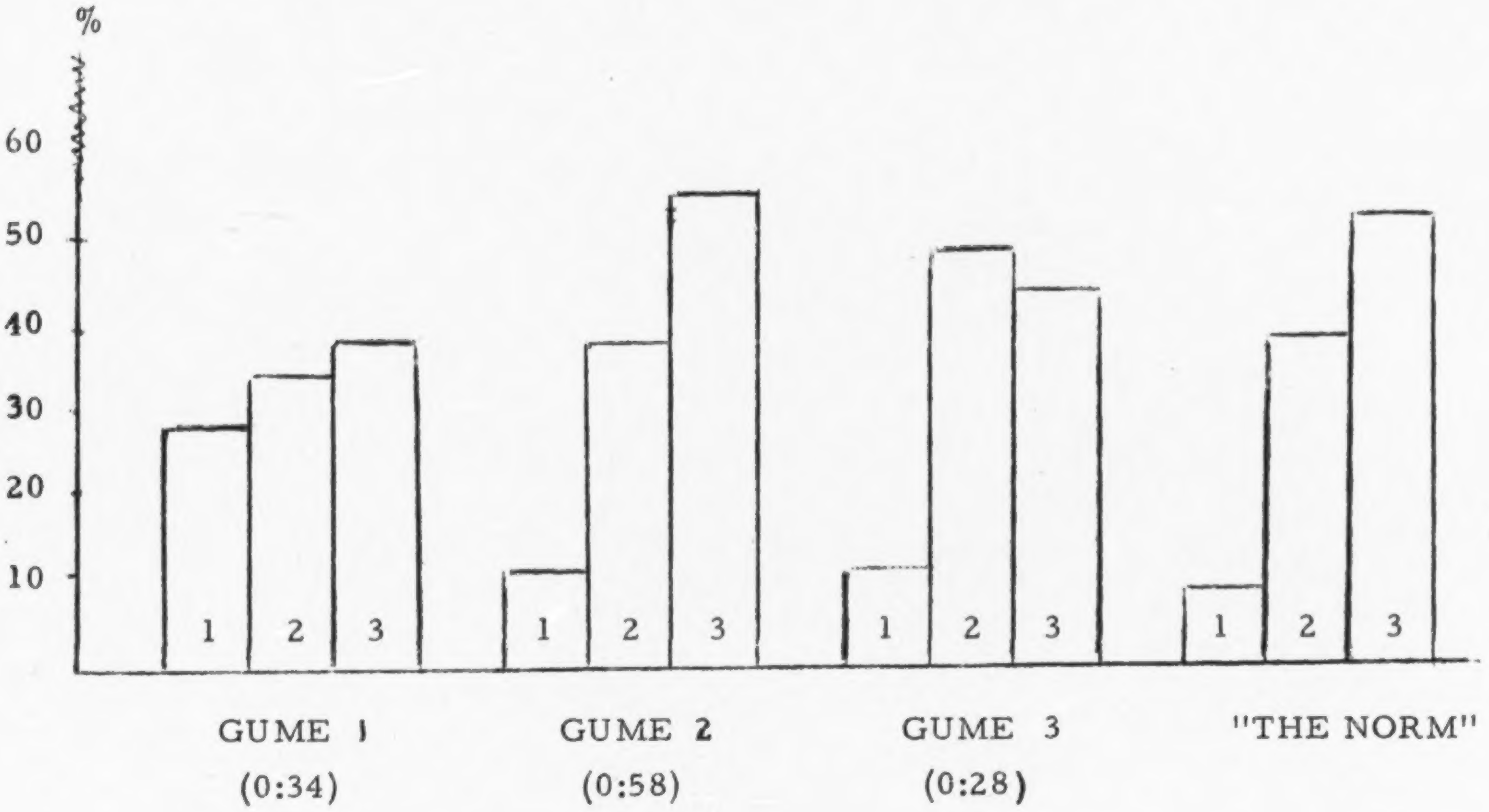
On the IQ test the three populations score almost exactly on the norm (= $\bar{x}$: 50). Considering the slight over-representation of pupils from Sk in our material, one might have expected the populations to score a little above the norm. This is also the case as regards Grades, though this can partly be explained by the well-known fact that there is a slight inflation in grades in schools to-day.

Table 6. Means and Standard Deviations for identical and non-identical variables in the three GUME projects. The entire student group (Sk + Ak)

	GUME 1			GUME 2			GUME 3		
Identical variables:	N	$\bar{x}$	s	N	$\bar{x}$	s	N	$\bar{x}$	s
Verbal IQ	340	5.08	1.83	299	4.96	1.74	291	5.09	1.91
Inductive IQ	340	5.14	1.93	299	5.07	2.04	301	5.07	2.11
Spatial IQ	337	5.02	1.91	300	4.82	1.93	300	4.99	2.02
IQ test, total	324	50.53	9.70	296	49.73	10.00	287	50.20	10.49
Grade English	351	3.21	1.07	309	3.18	1.02	333	3.22	1.05
Grade Swedish	349	3.21	1.04	309	3.20	0.93	333	3.19	0.98
Grade Maths	349	3.13	1.07	309	3.15	1.04	333	3.15	1.05
Grades total	345	28.68	8.75	309	28.56	8.13	333	28.65	8.27
IQ + Grades	315	79.29	19.87	289	78.67	16.73	283	79.19	17.76
Pupil Attitude	334	25.84	4.98	298	29.01	4.75	300	25.16	5.57
Attendance	356	5.79	0.40	318	5.79	0.41	337	5.78	0.42
Social class	322	2.10	0.81	260	2.45	0.68	309	2.32	0.67
PACT	-	-	-	298	50.58	9.60	292	52.26	9.12
Non-identical variables:									
Pretest	329	64.08	18.21	317	60.30	18.27	292	81.48	17.66
Posttest	325	72.91	20.89	317	75.43	20.03	262	90.20	19.99
Retest	323	75.31	20.73	294	76.57	20.58	286	91.54	21.25
CI (pretest)	-	-	-	292	3.10	1.78	-	-	-
CI (posttest)	-	-	-	310	4.39	2.09	-	-	-

In GUME 1 there is a relatively greater number of pupils from the "higher" social class (= lower scale value) than in the other two projects. This is due to the fact that three classes came from a private scool in which all the pupils take Sk and in which pupils from social class 1 dominate. The figure below illustrates the representativeness of the three part-projects as far as social class is concerned:

Fig. 3. **Distributions according to Social class (percentages) within the three part projects**



(0 = number of pupils for whom information as to the occupation of their parents could not be obtained.)

By "the norm" is meant the distribution of social class according to official statistics for Gothenburg (Andrakammarvalet i Göteborg 1968, U 1969:2 pp. 63-69). The deviation from the norm thus defined was Chi Square-tested for the three projects. The X^2 -values obtained were respectively: GUME 1: 175.53, GUME 2: 3.95, GUME 3: 9.21. GUME 2 is representative of the norm as regards distribution of social class whereas the two other projects deviate significantly from it, GUME 3 at the 1% level and GUME 1 excessively. Considering the great similarity between the part populations in the case of background variables that are used as covariates in the statistical analyses, the differences as regards social class should not seriously affect the external validity of the results.

Pupil Attitude should be regarded as a dependent variable. The questionnaire indicates that the pupils of GUME 2 have a more positive reaction towards the experiment than the pupils of GUME 1 and 3. According to the definitions of the scale points the pupils of GUME 1 och 3 can be said to have "tolerated" the experiment whereas the GUME 2 students are more positive than negative.

The non-identical variables do not permit any comparisons between the part projects; they have been included to illustrate the progress made during the experiment (see p. 48).

Means and standard deviations for Sk and Ak are presented in tables 7 and 8 (pp. 36-37). As could be expected the differences between the two courses are great in all cognitive variables (Sk >). As regards the pupils´attitudes towards the experiment there are no differences between the two courses, however. The great similarity between the total populations of GUME 1, 2 and 3 (Sk + Ak) is still present when the respective populations are divided into Sk and Ak. There are no statistically significant differences between any two part-projects in the case of Grades + IQ, the composite variable used as covariate in the analyses of covariance. Although tests of significance for differences between the three part-projects have not been performed in all possible cases, the overall impression (tables 7 and 8, Sk and Ak respectively) is one of great similarity between the part-projects. One exception is Social class, which has already been commented on.

Table 7. Means and Standard Deviations for identical and non-identical variables in the three GUME projects (Sk)

	GUME 1			GUME 2			GUME 3		
Identical variables:	N	$\bar{x}$	s	N	$\bar{x}$	s	N	$\bar{x}$	s
Verbal IQ	238	5.72	1.64	217	5.46	1.53	218	5.56	1.78
Inductive IQ	238	5.68	1.75	217	5.59	1.93	228	5.75	1.86
Spatial IQ	235	5.36	1.86	218	5.17	1.93	227	5.34	1.90
IQ test, total	228	53.92	8.48	214	52.85	9.00	215	53.56	9.23
Grade English	245	3.67	0.85	225	3.54	0.87	247	3.60	0.85
Grade Swedish	243	3.65	0.85	225	3.51	0.81	247	3.49	0.89
Grade Maths	243	3.54	0.92	225	3.47	0.94	247	3.45	0.96
Grades total	239	32.71	6.78	225	31.55	6.76	247	31.63	6.99
IQ + Grades	221	86.72	13.73	211	84.83	13.88	212	85.58	14.85
Pupil Attitude	237	25.79	5.10	217	28.96	4.56	223	25.05	5.63
Attendance	248	5.81	0.39	230	5.80	0.40	250	5.77	0.42
Social class	223	1.86	0.80	187	2.34	0.72	235	2.24	0.69
PACT	-	-	-	218	53.53	8.05	219	54.73	7.62
Non-identical variables:									
Pretest	230	70.59	16.35	230	65.26	17.26	214	87.26	16.33
Posttest	225	81.86	17.28	230	81.53	18.02	197	97.21	16.99
Retest	227	83.87	17.39	214	83.52	17.74	212	98.59	18.78
CI (Pretest)	-	-	-	222	3.35	1.82	-	-	-
CI (Posttest)	-	-	-	227	4.90	1.99	-	-	-

Table 8. Means and Standard Deviations for identical and non-identical variables in the three GUME projects (Ak)

	GUME 1			GUME 2			GUME 3		
Identical variables:	N	$\bar{x}$	s	N	$\bar{x}$	s	N	$\bar{x}$	s
Verbal IQ	102	3.59	1.34	82	3.65	1.56	73	3.71	1.58
Inductive IQ	102	3.90	1.75	82	3.67	1.63	73	2.95	1.30
Spatial IQ	102	4.25	1.82	82	3.91	1.63	73	3.90	1.99
IQ test, total	96	42.49	7.43	82	41.60	7.67	72	40.17	7.08
Grade English	106	2.14	0.70	84	2.23	0.72	85	2.11	0.74
Grade Swedish	106	2.21	0.67	84	2.37	0.67	85	2.32	0.68
Grade Maths	106	2.18	0.74	84	2.31	0.78	85	2.27	0.76
Grades total	106	19.58	5.09	84	20.57	5.76	85	20.08	5.09
IQ + Grades	94	61.80	10.37	78	62.00	11.76	71	60.11	10.67
Pupil Attitude	97	25.94	4.69	81	29.12	5.27	77	25.45	5.43
Attendance	108	5.76	0.43	80	5.76	0.43	86	5.79	0.41
Social class	99	2.64	0.52	73	2.73	0.48	73	2.58	0.52
PACT	-	-	-	80	42.55	8.91	73	44.86	9.32
Non-identical variables:									
Pretest	99	48.95	12.43	87	47.18	13.92	78	65.63	9.65
Posttest	100	52.76	12.42	87	59.31	15.72	65	68.97	11.66
Retest	96	55.06	12.12	80	58.00	15.58	73	71.47	13.70
CI (Pretest)	-	-	-	70	2.31	1.40	-	-	-
CI (Posttest)	-	-	-	83	3.00	1.72	-	-	-

Correspondingly means and standard deviations for boys and girls have been included (tables 10 and 11, pp. 39-40). When the two tables are compared the overall impression is one of superiority, at least in absolute figures, for the girls in all cognitive variables. The only exception is the Spatial test in GUME 3. That girls excel throughout in the case of grades is a well established fact (see for instance, Anastasi, A., 1958, pp. 492 ff). The same applies to tests of verbal functions, whereas boys usually excel on spatial tests (op.cit., pp. 472 ff). In our case no statistically significant differences are found between boys and girls on the spatial test, which might have the following explanation. The distribution of sex is fairly even within Sk, whereas in Ak the boys dominate. Table 9 illustrates the fact that within the easier course the boys/girls ratio is greater than within the more difficult course. When means are calculated for boys and girls respectively, the mean for the boys is biassed downwards because of the over-representation of boys in the easier course. Thus the general superiority of girls in our material is in line with expectation, although the magnitude is somewhat overestimated.

Table 9. Distribution of sex according to courses

	Sk		Ak		Boys/girls ratio	
	Boys	Girls	Boys	Girls	Sk	Ak
GUME 1	110	120	60	41	0.92	1.46
GUME 2	118	112	51	37	1.05	1.38
GUME 3	132	118	58	28	1.12	2.07

Summary: The three GUME populations are very similar as regards the background variables that have been further used in the statistical analyses. This applies to the total populations (Sk + Ak) as well as to the respective courses (Sk and Ak). One exception to this is Social class, where GUME 1 and 3 deviate from the norm. The three populations score almost exactly on the norm for the intelligence test. The pupils of GUME 2 are more positive towards the experiment than are the pupils of the two other experiments. No statistically significant differences are found between boys and girls as far as intelligence (total IQ) is concerned. In respect of grades and tests of linguistic proficiency the girls excel throughout.

Table 10. Means and Standard Deviations for identical and non-identical variables in the three GUME projects (Boys)

	GUME 1			GUME 2			GUME 3		
Identical variables:	N	$\bar{x}$	s	N	$\bar{x}$	s	N	$\bar{x}$	s
Verbal IQ	175	4.98	2.03	158	4.94	1.62	161	4.98	1.89
Inductive IQ	175	4.97	1.71	158	5.04	1.94	166	4.88	2.00
Spatial IQ	174	4.94	4.94	159	4.74	1.90	166	5.11	2.06
IQ test, total	167	49.77	9.15	156	49.48	9.65	158	49.72	10.23
Grade English	181	2.95	1.10	163	2.99	0.99	188	3.01	1.06
Grade Swedish	181	2.94	0.96	163	2.97	0.91	188	3.04	0.94
Grade Maths	181	3.06	1.13	163	3.09	1.06	188	3.17	1.07
Grades total	178	26.80	8.46	163	27.09	8.15	188	27.64	8.27
IQ + Grades	162	76.27	16.23	150	76.82	16.61	155	77.53	17.57
Pupil Attitude	173	25.74	4.80	156	28.65	4.98	169	24.83	5.64
Attendance	183	5.85	0.39	169	5.78	0.42	191	5.77	0.42
Social class	163	2.16	0.80	132	2.48	0.64	172	2.30	0.67
PACT	-	-	-	157	49.46	9.65	161	51.14	9.46
Non-identical variables:									
Pretest	169	60.96	17.90	168	57.76	16.85	165	79.06	17.38
Posttest	170	68.55	20.61	168	71.94	20.03	150	86.23	19.94
Retest	169	71.53	19.97	159	73.19	20.56	167	87.32	21.40

Table 11. Means and Standard Deviations for identical and non-identical variables in the three GUME projects (Girls)

	GUME 1			GUME 2			GUME 3		
Identical variables:	N	$\bar{x}$	s	N	$\bar{x}$	s	N	$\bar{x}$	s
Verbal IQ	165	5.20	1.91	141	4.99	1.86	130	5.24	1.92
Inductive IQ	165	5.33	2.14	141	5.09	2.15	135	5.30	2.22
Spatial IQ	163	5.11	2.13	141	4.91	1.98	134	4.84	1.96
IQ test, total	157	51.35	10.23	140	50.01	10.41	129	50.79	10.80
Grade English	170	3.49	1.05	146	3.39	1.01	145	3.48	0.97
Grade Swedish	168	3.51	1.05	146	3.46	0.88	145	3.39	1.00
Grade Maths	168	3.21	1.01	146	3.22	1.01	145	3.12	1.02
Grades total	167	30.68	7.17	146	30.21	7.81	145	29.96	8.11
IQ + Grades	153	82.47	17.53	139	80.67	16.69	128	81.20	17.85
Pupil Attitude	161	25.94	5.21	142	29.40	4.48	131	25.57	5.47
Attendance	173	5.74	0.44	149	5.81	0.40	146	5.79	0.41
Social class	159	2.04	0.82	128	2.41	0.73	137	2.35	0.68
PACT	-	-	-	141	51.83	9.70	131	53.64	8.54
Non-identical variables:									
Pretest	157	68.80	17.14	149	63.16	19.41	127	84.62	17.59
Posttest	155	77.69	20.11	149	79.36	19.35	112	95.53	18.86
Retest	154	79.45	20.83	135	80.56	19.95	119	97.46	19.63

Drop-outs

As was mentioned earlier, only pupils who took part in at least five out of the six lessons were included in the treatment comparisons. The others, i.e. the pupils who had been present for 1-4 lessons, were excluded from the data processing. We considered it worth while to investigate if the drop outs deviated in any systematic way from the main population, i.e. did the pupils with a high degree of absence score significantly higher or lower on the background variables? Furthermore, it was judged of interest to see if Attendance was a variable that correlated with progress made during the experiment. In the following three tables means and standard deviations for the three GUME populations and their respective drop outs will be presented. Differences between population and drop outs have been tested for significance (t-test).

Table 12. Means and Standard Deviations for the experimental population (Sk + Ak) and drop-outs. GUME 1

	POPULATION (= pupils present 5-6 lessons)			DROP OUTS (= pupils present 1-4 lessons)			
Variable:	N	$\bar{x}$	s	N	$\bar{x}$	s	t
Verbal IQ	340	5.08	1.83	55	4.82	1.87	0.96
Inductive IQ	340	5.14	1.93	55	5.18	2.08	-0.13
Spatial IQ	337	5.02	1.91	61	4.75	2.01	0.97
IQ test, total	324	50.53	9.70	48	48.65	10.24	1.20
Grade English	351	3.21	1.07	75	3.16	1.09	0.36
Grade Swedish	349	3.21	1.04	75	3.20	1.01	0.08
Grade Maths	349	3.13	1.07	75	3.09	1.15	0.28
Grades total	345	28.68	8.75	74	28.42	9.13	0.22
IQ + Grades	315	78.65	19.87	47	76.77	18.38	0.65
Pupil Attitude	334	25.84	4.98	33	25.06	6.41	0.68
Social class	322	2.10	0.81	68	2.09	0.81	0.09
PACT	-	-	-	-	-	-	-
Pretest	329	64.08	18.21	65	66.02	18.54	-0.77
Posttest	325	72.91	20.84	58	71.33	22.65	0.50
Retest	323	75.31	20.73	61	74.89	22.37	0.14
CI (Pretest)	-	-	-	-	-	-	-
CI (Posttest)	-	-	-	-	-	-	-

t-values underlined = statistically significant difference between population and drop-outs (min. 5% level).

There are no statistically significant differences between the experimental population and drop outs in GUME 1. There is a slight tendency for Attendance to covary with progress made during the experiment.

Table 13. Means and Standard Deviations for the experimental population (Sk + Ak) and drop-outs. GUME 2

	POPULATION (= pupils present 5-6 lessons)			DROP OUTS (= pupils present 1-4 lessons)			
Variable:	N	$\bar{x}$	s	N	$\bar{x}$	s	t
Verbal IQ	299	4.96	2.74	40	5.00	1.55	-0.70
Inductive IQ	299	5.07	2.04	41	4.98	1.93	0.03
Spatial IQ	300	4.82	1.93	40	5.32	1.86	-1.60
IQ test, total	296	49.73	10.00	38	50.97	9.66	-0.74
Grade English	309	3.18	1.02	49	2.92	1.02	1.69
Grade Swedish	320	3.20	0.93	49	3.04	0.91	1.13
Grade Maths	309	3.15	1.04	49	3.00	1.08	0.91
Grades total	309	28.56	8.13	49	26.88	8.01	1.37
IQ + Grades	289	78.67	16.73	36	78.36	15.94	0.11
Pupil Attitude	298	29.01	4.75	27	27.15	5.28	1.76
Social class	260	2.45	0.68	41	2.44	0.67	0.09
PACT	298	50.58	9.60	40	49.20	8.98	0.90
Pretest	317	60.30	18.27	50	54.82	18.37	1.96
Posttest	317	75.43	20.03	50	71.64	19.48	1.27
Retest	294	76.57	20.58	44	70.39	18.84	2.00
CI (Pretest)	292	3.10	1.78	42	2.60	1.52	1.89
CI (Posttest)	310	4.39	2.09	47	4.36	2.14	0.09

t-values underlined = statistically significant difference between population and drop outs (min. 5% level).

The only statistically significant differences are found in the Pre- and Retests. Since the experimental population is ahead of the drop outs before as well as after the experiment, no covariation between Attendance and progress can be said to exist.

Table 14. Means and Standard Deviations for the experimental population (Sk + Ak) and drop outs. GUME 3

	POPULATION (= pupils present 5-6 lessons)			DROP OUTS (= pupils present 1-4 lessons)			
Variable:	N	$\bar{x}$	s	N	$\bar{x}$	s	t
Verbal IQ	291	5.09	1.91	57	4.74	1.88	1.28
Inductive IQ	301	5.07	2.11	56	4.29	2.13	2.52
Spatial IQ	300	4.99	2.02	56	4.62	1.97	1.28
IQ test, total	287	50.20	10.49	55	46.96	10.64	2.08
Grade English	333	3.22	1.05	72	2.65	1.02	4.38
Grade Swedish	333	3.19	0.98	73	2.74	0.94	3.67
Grade Maths	333	3.15	1.05	73	2.73	1.03	3.13
Grades total	333	28.65	8.27	73	24.41	8.05	4.04
IQ + Grades	283	79.19	17.76	54	72.09	18.26	2.63
Pupil Attitude	300	25.16	5.57	55	26.13	5.00	-1.30
Social class	309	2.32	0.67	59	2.56	0.68	2.53
PACT	292	52.26	9.12	58	46.62	11.78	2.23
Pretest	292	81.48	17.66	50	79.50	26.85	0.50
Posttest	262	90.20	19.99	52	81.67	20.29	2.78
Retest	286	91.54	21.25	45	83.89	25.32	1.92
CI (Pretest)	-	-	-	-	-	-	-
CI (Posttest)	-	-	-	-	-	-	-

t-values underlined = statistically significant difference between population and drop-outs (min. 5% level).

The table shows that the drop-outs deviate systematically from the experimental population. The pupils with a higher degree of absence score comparatively low on the background variables. It can not be definitely concluded that pupils with low grades and intelligence have played truant, although such an interpretation seems reasonable. Somewhat surprisingly, the drop-outs have a more positive attitude towards the experiment than does the main population.

The results on the Pre-, Post- and Restest indicate that there is a positive correlation between attendance and progress made during the experiment.

Summary: The drop-outs, defined as pupils taking part in only 1-4 out of the 6 lessons, do not deviate from the main population in the case of GUME 1 and GUME 2. In GUME 3 the drop-outs show a systematic bias in that they consist of pupils with low IQ and grades. In GUME 1 there is a slight and in GUME 3 a clear tendency towards a positive correlation between degree of attendance and progress made during the experiment.

Note:

The discussion concerning an eventual covariation between Attendance and Progress may need some clarification. No correlation coefficients have been calculated, nor did the design include any control group that underwent the Pre-, Post- and Retests but no treatment. Although it is theoretically possible that such a control group would have demonstrated the same amount of progress as did the experimental groups, there is an extremely low probability for this in our experiment, where specific grammatical structures were taught for a rather short period of time. The rough comparisons that have been made above are between one group that has been present during practically the whole experiment (the main population) and one group that has been absent a great deal (the drop outs). Differences between the two groups (if to the advantage of the main population on Post- and Retest) would be an indication of a positive correlation between Attendance and Progress.

Correlation studies

The heading is pretentious; in this report only a sample of correlations will be presented with the object of giving a complementary description of the experimental populations. In actual practice intercorrelations between all variables were calculated in the three projects. Correlations were calculated for Sk + Ak as well as for Sk and Ak separately. The correlations are discussed at greater length in the part-project reports.

Three correlation matrices will be presented consecutively and commented on afterwards. The total number of pupils will be given for each matrix. The separate correlations are based on somewhat varying entries depending on stray absences.

Table 15. Intercorrelations between selected variables
GUME 1. Sk + Ak N = 356

	2	3	4	5	6	7	8	9	10
1. Social class	-.329	-.398	-.453	-.475	-	-.453	-.483	-.470	.106
2. Verbal IQ		.747	.626	.692	-	.583	.620	.629	-.121
3. IQ test, total			.630	.733	-	.596	.616	.629	-.051
4. Grade English				.925	-	.773	.813	.828	-.088
5. Grades total					-	.721	.802	.820	-.095
6. PACT						-	-	-	-
7. Pretest							.898	.874	.106
8. Posttest								.942	-.089
9. Retest									-.055
10. Pupil Attitude									

Table 16. Intercorrelations between selected variables
GUME 2. Sk + Ak N = 318

	2	3	4	5	6	7	8	9	10
1. Social class	-.240	-.205	-.253	-.271	-.266	-.281	-.297	-.273	.093
2. Verbal IQ		.734	.634	.684	.565	.573	.632	.584	-.088
3. IQ test, total			.633	.712	.598	.566	.630	.587	-.110
4. Grade English				.903	.603	.630	.700	.682	-.007
5. Grades total					.588	.610	.682	.664	-.064
6. PACT						.637	.710	.691	.021
7. Pretest							.822	.799	-.009
8. Posttest								.869	-.007
9. Retest									.056
10. Pupil Attitude									

Table 17. Intercorrelations between selected variables
GUME 3. Sk + Ak N = 337

	2	3	4	5	6	7	8	9	10
1. Social class	-.261	-.305	-.312	-.349	-.175	-.227	-.308	-.305	-.034
2. Verbal IQ		.760	.605	.681	.520	.600	.649	.621	-.173
3. IQ test, total			.664	.767	.486	.647	.678	.666	-.168
4. Grade English				.903	.652	.766	.805	.805	-.021
5. Grades total					.584	.768	.789	.796	-.048
6. PACT						.649	.651	.651	.030
7. Pretest							.858	.839	-.019
8. Posttest								.892	-.040
9. Retest									-.008
10. Pupil Attitude									

The three correlation matrices indicate the following:

1. The patterns of correlations are very much alike in the three matrices, which is still an indication that the three populations are comparable in all essentials.

2. Significant correlations in the order of .20 - .40 are found between Social class on the one hand and IQ, Grades and proficiency in English on the other. These correlations are a little higher in GUME 1 than in the two other projects, which can be explained by the greater variation of scores in the Social class variable in GUME 1.

3. Pupil Attitude (towards the pedagogical and technical aspects of the experiment) does not correlate with any other variable.

4. The correlations between the three tests of proficiency in English (Pre-, Post- and Retest) and Grade English are of the same magnitude as the corresponding correlations between the three mentioned tests and Grades total, which might be seen as an illustration of the difficulty of devising tests of linguistic ability without measuring a more general (scholastic) ability at the same time.

5. The problem just mentioned is also illustrated by the fact that the correlations between the tests of English and the Verbal IQ are of the same magnitude as the correlations between the English tests and the IQ test, total.

6. The intercorrelations between the three tests of English are very high. Since we are dealing with an identical test administrered on three occasions, the correlations may be regarded as retest-reliability coefficients. As such they are very satisfactory for the purposes of the experiment (comparisons between groups).

Progress

Althoughthe main interest of the present study is tied to "differential progress", i.e. if the three teaching strategies gave different learning effects, it is of pedagogical interest to investigate the amount of learning increments in absolute figures. Did the pupils make any progress irrespective of what teaching method they had been assigned to? The progress made by the three GUME populations (Sk + Ak, Sk, Ak) can be inferred from tables 6, 7 and 8. Figure 4 on the next page is an attempt to make the progress rates clearer.

Since the standard deviations of the Pre-, Post- and Retest were approximately the same, the following principle has been followed in the diagram: The lowest score ($\overline{x}$) on any test, which in all the three projects was the Pretest score of Ak, is the zero point on the Y axis which indicates the raw scores on the different tests in relation to the zero point.

The following conclusions may be drawn from figure 4:

1. Sk scores substantially higher than Ak on all three tests.
2. Sk has a steeper learning curve than Ak, i.e. the pupils of Sk have learnt more during the same period of time. Thus differences between teaching methods, if any, should be easier to detect in Sk than in Ak because of the greater average progress in Sk.
3. There is a slight tendency towards progress from Posttest to Retest.

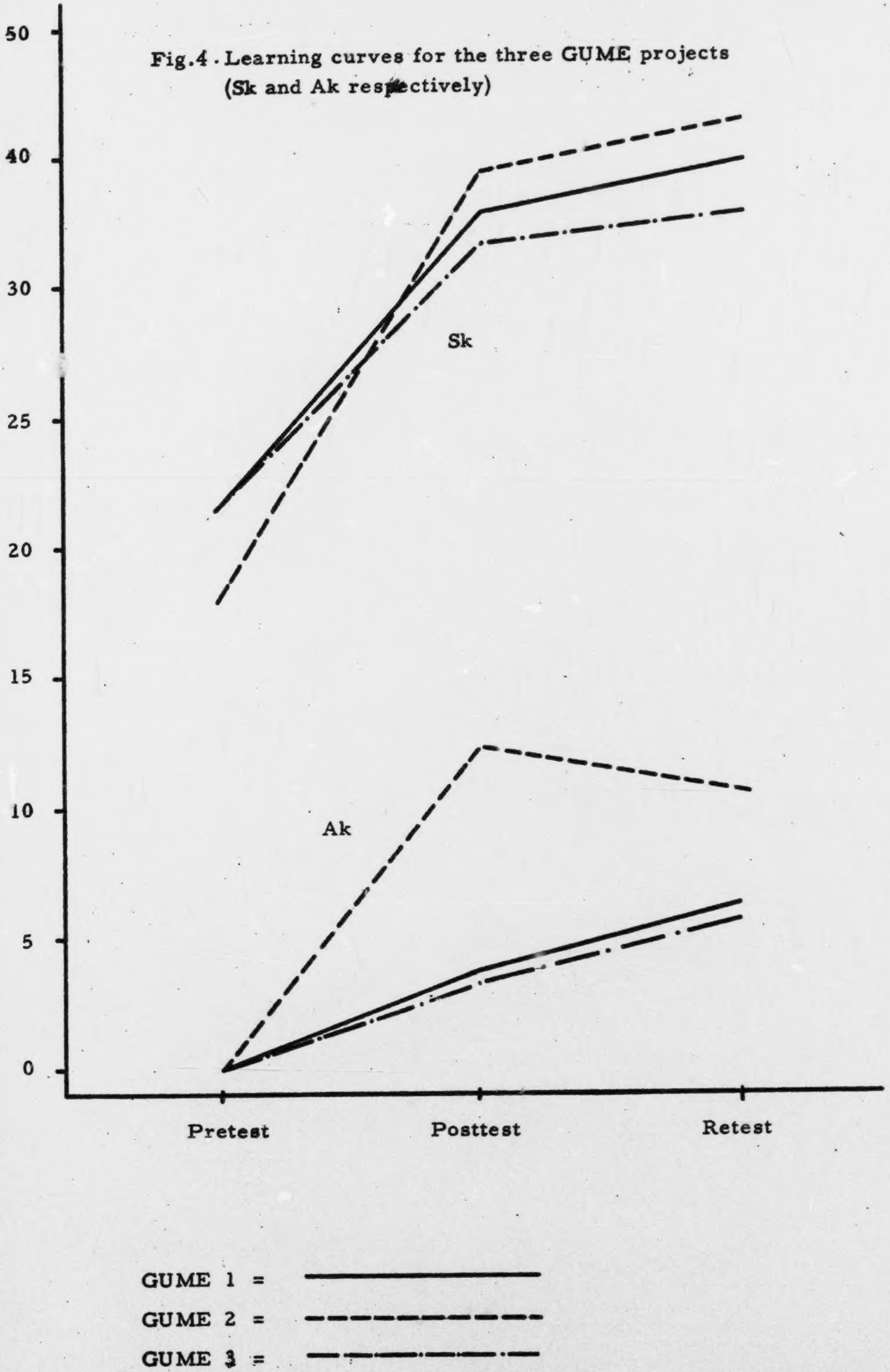


Fig.4. Learning curves for the three GUME projects (Sk and Ak respectively)

Method comparisons (Main effects)

Which of the three teaching methods proved to be the best? Finding an answer to this question is the most important objective of the present investigation. Two types of statistical calculations, analysis of variance and covariance, were performed and will be presented separately. In the case of analysis of covariance, the populations were divided into the two courses, Sk and Ak, whereas in the analysis of variance a corresponding division was made into three ability levels (Upper, Middle, Lower.)

A. Comparisons between courses (Sk and Ak)

Four different analyses of covariance, using different covariates and dependent variables, were performed within each project. Tables 18-21 give the details and table 22 a survey of the results.

Table 18. Analysis of covariance No. 1
Dependent variable: Progress 1
Covariate: IQ + Grades

		Adjusted means			ss'_y				x)
	Course type	Im	Ee	Es	between	within	df	F-ratio	b_w
GUME 1	Sk	11.11	9.81	11.67	117	14911	2/189	0.742	.107
	Ak	7.84	3.31	1.86	370	5271	2/79	2.773	.027
GUME 2	Sk	16.84	14.37	18.13	527	23162	2/207	2.353	.100
	Ak	12.75	13.13	12.94	2	11908	2/73	0.006	.321
GUME 3	Sk	12.06	9.03	11.50	310	18202	2/167	1.421	.038
	Ak	1.95	4.68	3.25	71	5228	2/67	0.456	.055

ss'_y = Adjusted sum of squares in the dependent variable

b_w = The within-groups regression coefficient

x) = Underlined values significant at the 5% level

All the within-groups regression coefficients are small, indicating a very low correlation between Progress and IQ + Grades. This was expected (see p. 24). The low correlations have the consequence, however, that the gain in precision with analysis of covariance, as compared to analysis of variance, is negligible. In table 18 there are no significant differences in learning effects between the methods. The adjusted means show only one trend that the three projects have in common: In course Sk the Explicit-English method is the least efficient. Within course Ak no consistent pattern is discernible. (One tendency common to all the projects is that Sk is superior to Ak, which is of little interest here, however.)

Table 19. Analysis of covariance No. 2
Dependent variable: Progress 2
Covariate: IQ + Grades

		Adjusted means			ss'_y				
	Course type	Im	Ee	Es	between	within	df	F-ratio[x)]	b_w
GUME 1	Sk	14.86	11.75	14.04	324	18391	2/178	1.568	.158
	Ak	5.78	6.35	5.39	16	4935	2/73	0.118	-.056
GUME 2	Sk	18.46	18.74	19.83	61	27883	2/191	0.209	..024
	Ak	11.67	11.82	9.25	80	9238	2/66	0.286	.255
GUME 3	Sk	11.92	13.81	11.53	186	25565	2/173	0.630	.085
	Ak	5.96	7.45	7.45	23	5790	2/68	0.137	.169

The F-ratios are consistently lower than in the preceding table. Tendencies towards differences between treatments immediately after the experiment, are thus eliminated at the time of the Retest. (As was evident in figure 4, p. 49 , however, the progress made had not disappeared but rather increased a little.) Considering the low F-ratios in table 19, a closer inspection of the rank order of the adjusted means would be meaningless.

Table 20. Analysis of covariance No. 3
Dependent variable: Posttest
Covariate: Pretest

	Course type	Adjusted means Im	Ee	Es	ss'_y between	within	df	F-ratio x)	b_w
GUME 1	Sk	82.09	80.79	82.82	152	15283	2/203	1.009	.906
	Ak	56.74	51.68	51.06	422	5150	2/88	3.155	.808
GUME 2	Sk	82.05	80.10	82.68	280	23851	2/226	1.328	.863
	Ak	58.63	60.46	58.57	70	13619	2/83	0.214	.670
GUME 3	Sk	98.41	95.76	98.88	380	17461	2/188	2.045	.793
	Ak	68.07	70.22	69.57	53	4987	2/73	0.389	.789

The within-groups regression coefficients are very high and indicate that a gain in precision is achieved by using the present covariate. The table points to one statistically significant difference between treatments, namely in GUME 1, course Ak, where the Implicit method is superior to the others. Tests of significance gave the following t-values: Im - Es = 2.39 Im - Ee = 2.15. The results in table 20 show the same pattern as the results in table 18.

Since we found one statistically significant difference between treatments, a test of homogeneity of regression was made. (For procedure and symbols, see Snedecor & Cochran, 1969, pp. 432 ff).

Table 21. Test of homogeneity of regression for GUME 1, Ak
Dependent variable: Posttest
Covariate: Pretest

					Deviations from regression			
Within	df	$\Sigma(x-\bar{x})^2$	$\Sigma(x-\bar{x})(y-\bar{y})$	$\Sigma(y-\bar{y})^2$	Regr. coeff.	df	SS	mS
Im	17	1996	1884	2798	0.944	16	1020	63.75
Ee	37	6460	5000	5463	0.774	36	1593	44.25
Es	34	5036	4012	5689	0.797	33	2493	75.55
						85	5106	60.07
Pooled, w.	88	13492	10896	13950	0.808	87	5150	59.20

F = 44/60.07 = 0.73 N.S. (df: 2/85)

The regression lines do not deviate significantly from parallellism. Thus interpretation of the differences between treatment effects is permitted.

The adjusted means in table 20 show the same pattern as the corresponding values in table 18: Ee is the least efficient method in the three Sk groups. Within Ak there is still no consistent pattern to the ranking of the methods.

Table 22. Analysis of covariance No. 4
Dependent variable: Retest
Covariate: Pretest

		Adjusted means			ss'_y				
	Course type	Im	Ee	Es	between	within	df	F-ratio$^{x)}$	b_w
GUME 1	Sk	83.77	83.33	83.83	295	19913	2/208	1.541	.883
	Ak	56.29	54.86	54.54	37	5056	2/84	0.307	.776
GUME 2	Sk	83.23	83.70	83.64	11	27534	2/210	0.043	.812
	Ak	59.14	58.09	55.94	114	10902	2/75	0.392	.759
GUME 3	Sk	98.87	101.18	100.07	177	28029	2/198	0.624	.752
	Ak	71.56	70.76	72.98	85	7350	2/81	0.466	1.037

As in table 19 the F-ratios in the above table indicate that tendencies towards method differences immediately after the experiment have disappeared at the time of the Retest (approximately one month later).

In order to further clarify the tendencies discovered so far, we give a survey of them in the table below. We have subjectively chosen the F-ratio 2.00 as criterion for "interpretable differences" between treatments.

Table 23. Survey of "interpretable differences" in the analyses of covariance

Dep = Dependent variable Cov = Covariate	Course type	F-ratio	GUME 1	GUME 2	GUME 3
Dep = Progress 1	Sk	2.353		Es=Im>Ee	
Cov = IQ + Grades	Ak	2.773	Im>Ee=Es		
Dep = Progress 2	Sk				
Cov = IQ + Grades	Ak				
Dep = Posttest	Sk	2.045			Es=Im>Ee
Cov = Pretest	Ak	3.155	Im>Ee=Es		
Dep = Retest	Sk				
Cov = Pretest	Ak				

Twenty-four analyses of covariance have been performed, eight within each part-project. In this perspective the only significance obtained could have occurred by chance. It is evident from the table that none of the tendencies towards differences are common to two projects. Within one project only one tendency is repeated: In GUME 1, course Ak, the Implicit method is superior to the two Explicit methods. Concerning the differences obtained in GUME 2 and GUME 3, they represent the type of result that is difficult, if not impossible, to interpret (see the discussion on p. 30. The superiority of Es and Im cannot be unequivocally explained by reference to the language of instruction (Swedish/English) or explanations. One of the two superior methods (Es) made use of explanations; so did the least efficient (Ee). One of the two superior methods (Im) used English as the language of instruction; so did the least efficient (Ee).

Before the method comparisons are commented on further, the analyses of variance will be presented. Although the experimental population is divided according to other principles in the analyses of variance, there is a certain similarity between the two types of calculations.

B. Comparisons between ability groups (Upper, Middle, Lower)

A number of analyses of variance, one-way classification, will be presented. The presentation is analogous to the one under A; first the analyses for each dependent variable are given, then follows a survey.

Table 24. Analyses of variance (one-way) of Progress 1.

	Ability level	Means			Sum of squares		df	F-ratio[x)]
					between	within		
	U	13.04	8.75	12.24	264	6600	2/85	1.697
GUME 1	M	8.73	9.55	9.77	18	9207	2/90	0.087
	L	9.45	4.75	3.86	428	5953	2/92	3.309
	U	17.45	15.92	19.29	166	10135	2/87	0.714
GUME 2	M	17.42	14.95	16.88	127	10454	2/99	0.602
	L	11.07	11.53	14.97	282	15268	2/93	0.859
	U	12.32	11.54	15.64	234	6081	2/71	1.367
GUME 3	M	9.42	4.58	10.76	506	6667	2/65	2.467
	L	7.60	7.37	3.68	210	6633	2/64	1.012

[x)] underlined values = significant at the 5% level

There is one significant difference in the table; in GUME 1 (L) the Implicit method is superior to the two methods utilizing explanations. The following t-values were obtained when Im was compared to the other methods: Im - Ee: 2.45 Im - Es: 2.55. These tendencies closely resemble those found in the corresponding analysis of covariance (table 18 p. 50). Between the three projects there is only one common tendency: at ability level U the Ee method is ranked last.

Table 25. Analyses of variance (one-way) of Progress 2

	Ability level	Means			Sum of squares between	Sum of squares within	df	F-ratio
	U	16.57	13.09	15.29	159	8848	2/84	0.754
GUME 1	M	12.90	11.00	12.03	54	9856	2/87	0.239
	L	8.81	6.84	6.59	72	6095	2/89	0.526
	U	19.64	19.56	19.17	3	11798	2/82	0.011
GUME 2	M	17.03	18.23	18.52	38	12128	2/88	0.138
	L	12.67	12.80	15.00	96	15116	2/86	0.274
	U	13.92	17.21	15.69	135	9472	2/76	0.543
GUME 3	M	10.20	9.84	11.95	56	8406	2/63	0.210
	L	9.25	8.41	6.19	122	7326	2/71	0.592

The similarity to the corresponding analysis of covariance (table 19 p. 51) is great as far as F-ratios are concerned. At the time of the Retest no differences whatsoever exist between the treatment groups.

Table 26. Analyses of variance (one-way) of the Posttest

	Ability level	Means			Sum of squares between	Sum of squares within	df	F-ratio
	U	91.63	89.74	91.59	67	21235	2/90	0.142
GUME 1	M	75.69	79.00	71.85	857	22779	2/96	1.807
	L	60.44	52.84	53.78	936	15950	2/100	2.935
	U	93.17	91.70	94.96	155	22911	2/87	0.294
GUME 2	M	76.45	76.13	74.48	63	19418	2/99	0.162
	L	57.79	59.89	61.39	195	21408	2/93	0.423
	U	103.32	106.26	109.00	451	15187	2/80	1.190
GUME 3	M	87.28	85.40	94.76	1226	17096	2/72	2.581
	L	69.11	72.29	75.36	425	10696	2/72	1.430

There are no statistically significant differences in the table, although two F-ratios may be interpreted as tendencies in that direction. In GUME 1 (U) the Implicit method has a higher mean than the two explicit methods, in GUME 3 (M) the Explicit-Swedish method is the best in absolute figures. The three teaching strategies are not ranked in any systematic order among the three projects; this applies to all ability levels.

Table 27. Analyses of variance (one-way) of the Retest

	Ability level	Means			Sum of squares between	Sum of squares within	df	F-ratio
	U	94.97	90.80	95.31	345	19795	2/88	0.768
GUME 1	M	78.13	80.13	75.03	424	20644	2/92	0.944
	L	60.50	55.78	56.17	378	13292	2/96	1.364
	U	94.14	94.65	92.74	51	23428	2/82	0.090
GUME 2	M	75.09	78.77	74.76	314	20841	2/88	0.662
	L	60.00	60.97	63.15	142	22278	2/87	0.276
	U	105.41	112.00	111.61	784	18202	2/83	1.786
GUME 3	M	87.31	91.59	96.46	997	18738	2/72	1.916
	L	72.60	72.04	76.53	365	12642	2/79	1.139

Again we find that the tendencies towards treatment differences that existed immediately after the experiment have disappeared one month later. The three teaching methods are not ranked similarly between the three projects; this again applies to all ability levels.

The next table presents analyses of variance for those variables that were not common to the three projects (see discussion on p. 26).

Table 28. Analyses of variance (one-way) for selected variables
GUME 1: Progress 3 GUME 2: Critical items

	Ability level	Means			Sum of squares between	Sum of squares within	df	F-ratio
GUME 1	U	3.92	2.52	3.74	29	2850	2/81	0.407
	M	3.48	1.23	3.53	107	4859	2/89	0.981
	L	1.09	2.81	2.19	41	5622	2/88	0.319
GUME 2	U	0.76	1.97	1.79	26	372	2/87	3.057
	M	1.23	1.51	1.83	5	419	2/93	0.582
	L	1.30	0.78	0.96	3	294	2/71	0.381

There are no statistically significant differences in the table although in GUME 2 (U) the F-ratio is near the critical value for significance (3.10). Nevertheless, there is in the table one mystifying series of means: Within Im the ability levels are ranked L>M>U. This puzzling circumstance and the fact that "Critical items" contains a very limited number of items, have decided us to abstain from interpreting the tendency.

In the following table a survey is given of the tendencies found in the analyses of variance. We have subjectively chosen the F-ratio 2.00 as criterion for interpretable differences.

Table 29. Survey of "interpretable differences" in the analyses of variance (one-way) common to the three projects

Dependent variable	Ability level	F-ratio	GUME 1	GUME 2	GUME 3
Progress 1	U				
	M	2.467			Es=Im>Ee
	L	3.309	Im>Ee=Es		
Progress 2	U				
	M				
	L				
Posttest	U				
	M	2.582			Es>Im=Ee
	L	2.935	Im>Es=Ee		
Retest	U				
	M				
	L				

Altogether 34 analyses of variance were performed. The one statistically significant difference found could thus be explained as a chance occurrence. Using our subjective criterion for interpretation of differences (F: 2.00) we find three more tendencies. In GUME 1 pupils of low ability seem to profit most from the Implicit method, in GUME 3 the pupils at ability level M profit most from Es. In GUME 2 no tendencies towards differences were obtained. It is thus clear that no pattern, consistent for the three projects, was found in the one-way analyses of variance.

Interaction effects

In order to investigate the interaction between teaching strategy and ability level, a number of analyses of variance (two-way classification) were performed. The intention was to have the computer do the calculations, but at the time of data processing there was no program available that could handle missing data and unequal numbers of students in the different cells. The analyses in the following section have thus been made by hand. Since it was clear from the one-way analyses that treatment differences did not exist at the time of the Retest, two of the dependent variables have not been included in the two-way analyses: Retest and Progress 2. In the following analyses correction for unequal numbers of students in the different cells has been made according to a procedure suggested by Ferguson, G.A. (1959, pp. 259 ff). Although the numbers of observations in the cells differed, they did not in any case deviate significantly from equality or proportionality. The following tables show the adjusted values on which the analyses have been based.

Table 30. Analysis of variance (two-way classification). GUME 1, Progress 1

Ability level	Teaching method Im	Ee	Es	Total:
U	N=24 $\bar{x}$: 13.04	N=31 $\bar{x}$: 8.74	N=33 $\bar{x}$: 12.24	N=88 $\bar{x}$: 11.23
M	N=25 $\bar{x}$: 8.72	N=33 $\bar{x}$: 9.55	N=35 $\bar{x}$: 9.77	N=93 $\bar{x}$: 9.41
L	N=27 $\bar{x}$: 9.44	N=33 $\bar{x}$: 4.76	N=35 $\bar{x}$: 3.86	N=95 $\bar{x}$: 5.76
Total:	N=76 $\bar{x}$: 10.34	N=97 $\bar{x}$: 7.66	N=103 $\bar{x}$: 8.55	N=276 $\bar{x}$: 8.73

Source of variation	Sum of squares	df	Variance estimate
Rows (U, M, L)	1.432	2	716
Columns (Im, Ee, Es)	312	2	156
Interaction	535	4	134
Within cells	21.759	267	81
Total	24.038	275	

$F_i = 1.65 > 5\%$ $F_c = 1.93 > 5\%$ ($F_r = 8.84 < 1\%$)

The interaction term is not significant. The tendency towards interaction, if an F-ratio of 1.65 can be interpreted as such, is for the Implicit method to be better at the lowest level of ability and for Es to be relatively better at the higher levels. It is noticeable that the pupils of low ability in Im score higher than pupils of high ability in Ee. However, the Implicit method ranks first even at the highest level of ability, which contributes to the tendency towards a column (teaching method) effect ($F_c = 1.93$). The F-ratios for rows (ability levels) are given for the sake of completeness.

Table 31. Analysis of variance (two-way classification).
GUME 1, Posttest

Ability	Teaching method			
level	Im	Ee	Es	Total:
U	N=26 $\bar{x}$: 91.65	N=33 $\bar{x}$: 89.73	N=34 $\bar{x}$: 91.62	N=93 $\bar{x}$: 90.97
M	N=28 $\bar{x}$: 75.68	N=35 $\bar{x}$: 78.97	N=36 $\bar{x}$: 71.86	N=99 $\bar{x}$: 75.45
L	N=28 $\bar{x}$: 60.43	N=37 $\bar{x}$: 52.84	N=38 $\bar{x}$: 53.80	N=103 $\bar{x}$: 55.25
Total:	N=82 $\bar{x}$: 75.54	N=105 $\bar{x}$: 73.14	N=108 $\bar{x}$: 71.72	N=295 $\bar{x}$: 73.29

Source of variation	Sum of squares	df	Variance estimate
Rows (U, M, L)	63.003	2	31.502
Columns (Im, Ee, Es)	682	2	341
Interaction	1.342	4	336
Within cells	60.322	286	211
Total:	125.349	294	

$F_i = 1.59 > 5\%$ $F_c = 1.62 > 5\%$ $(F_r = 149.30)$

The results correspond roughlyto those in the preceding table. The interaction term is not significant although there is a slight tendency for pupils of low ability to do better with the Implicit method; this is not so for pupils of high ability.

Table 32. Analysis of variance (two-way).
GUME 2, Progress 1

Ability level	Teaching method Im	Ee	Es	Total:
U	N=30 $\bar{x}$: 17.43	N=35 $\bar{x}$: 15.91	N=25 $\bar{x}$: 19.28	N=90 $\bar{x}$: 17.36
M	N=34 $\bar{x}$: 17.41	N=40 $\bar{x}$: 14.95	N=28 $\bar{x}$: 16.89	N=102 $\bar{x}$: 16.30
L	N=32 $\bar{x}$: 11.06	N=37 $\bar{x}$: 11.54	N=27 $\bar{x}$: 14.96	N=96 $\bar{x}$: 12.34
Total:	N=96 $\bar{x}$: 15.30	N=112 $\bar{x}$: 14.13	N=80 $\bar{x}$: 16.99	N=288 $\bar{x}$: 15.31

Source of variation	Sum of squares	df	Variance estimate
Rows (U, M, L)	1.321	2	661
Columns (Im, Ee, Es)	383	2	192
Interaction	170	4	43
Within cells	35.889	279	129
Total:	37.763	287	

$F_i = 0.33 > 5\%$ $F_c = 1.49 > 5\%$ $(F_r = 5.12 < 1\%)$

No interaction exists between teaching method and ability level, nor is there any difference between treatments.

Table 33. Analysis of variance (two-way).
GUME 2, Posttest

Ability level	Teaching method Im	Ee	Es	Total:
U	N=30 $\bar{x}$: 93.13	N=35 $\bar{x}$: 91.71	N=25 $\bar{x}$: 95.00	N=90 $\bar{x}$: 93.10
M	N=34 $\bar{x}$: 76.47	N=40 $\bar{x}$: 76.15	N=28 $\bar{x}$: 74.46	N=102 $\bar{x}$: 75.79
L	N=32 $\bar{x}$: 57.78	N=37 $\bar{x}$: 59.89	N=27 $\bar{x}$: 61.37	N=96 $\bar{x}$: 59.60
Total:	N=96 $\bar{x}$: 75.45	n=112 $\bar{x}$: 75.64	N=80 $\bar{x}$: 76.46	N=288 $\bar{x}$: 75.81

Source of variation	Sum of squares	df	Variance estimate
Rows (U, L, M)	52.117	2	26.059
Columns (Im, Ee, Es)	49	2	25
Interaction	374	4	94
Within cells	63.125	279	226
Total	115.665	287	

$F_i = 0.42 > 5\%$ $F_c = 0.11 > 5\%$ $(F_r = 115.31)$

As in the preceding table, the results from the one-way analyses of variance are confirmed; There are no differences between teaching methods. Nor is there any evidence of interaction.

Table 34. Analysis of variance (two-way).
GUME 3, Progress 1

Ability level	Teaching method Im	 Ee	 Es	 Total:
U	N=21 $\bar{x}$: 12.33	N=28 $\bar{x}$: 11.54	N=25 $\bar{x}$: 15.64	N=74 $\bar{x}$: 13.15
M	N=19 $\bar{x}$: 9.42	N=25 $\bar{x}$: 4.60	N=24 $\bar{x}$: 10.75	N=68 $\bar{x}$: 8.12
L	N=19 $\bar{x}$: 7.58	N=25 $\bar{x}$: 7.36	N=23 $\bar{x}$: 3.70	N=67 $\bar{x}$: 6.16
Total:	N=59 $\bar{x}$: 9.86	N=78 $\bar{x}$: 7.97	N=72 $\bar{x}$: 10.19	N=209 $\bar{x}$: 9.27

Source of variation	Sum of squares	df	Variance estimate
Row (U, M, L)	1.850	2	925
Columns (Im, Ee, Es)	213	2	107
Interaction	749	4	187
Within cells	19.640	200	98
Total	22.452	208	

$F_i = 1.91 > 5\%$ $F_c = 1.09 > 5\%$ $(F_r = 9.44 < 1\%)$

Although the interaction term is not significant, the indication is that pupils of low ability gain most from the Implicit method whereas pupils of higher ability score higher in the Es method. This result, although it roughly corresponds to the interaction tendencies found in GUME 1, is somewhat surprising because of the low similarity to the corresponding analysis of covariance for GUME 3 (table 18 p. 50), where the Implicit method ranked last at the lowest level (Ak).

Table 35. Analysis of variance (two-way).
GUME 3, Posttest

Ability level	Teaching method			
	Im	Ee	Es	Total:
U	N=26	N=29	N=28	N=83
	$\bar{x}$: 103.38	$\bar{x}$: 106.24	$\bar{x}$: 109:00	$\bar{x}$: 106.28
M	N=23	N=27	N=25	N=75
	$\bar{x}$: 87.26	$\bar{x}$: 85.41	$\bar{x}$: 94.76	$\bar{x}$: 89.09
L	N=23	N=27	N=25	N=25
	$\bar{x}$: 69.13	$\bar{x}$: 72.29	$\bar{x}$: 75.36	$\bar{x}$: 72.35
Total:	N=72	N=83	N=78	N=233
	$\bar{x}$: 87.29	$\bar{x}$: 88.42	$\bar{x}$: 93.65	$\bar{x}$: 89.82

Scource of variation	Sum of squares	df	Variance estimate
Rows (U, M, L)	45.418	2	22.709
Columns (Im, Ee, Es)	1.769	2	885
Interaction	367	4	92
Within cells	43.265	224	193
Total	90.819	232	

$F_i = 0.48 > 5\%$ $F_c = 4.59 < 5\%$ $(F_r = 117.66)$

The interaction is insignificant for the obvious reason that one method (Es) excels at all levels, which produces a significant column effect. As was apparent from the one-way analyses of variance (table 26, p. 56), however, the superiority of Es was not statistically significant at any level of ability.

To summarize the study of interaction effects, it is clear that no statistically significant interaction exists between teaching method and ability level. The investigation of main effects (overall treatment differences, i.e. without taking ability levels into account) gave contradictory results. In GUME 1 the tendency was for the Implicit method to excel, in GUME 3 the Explicit-Swedish method ranked first whereas in GUME 2 no differences between the teaching methods were discerned.

Summary: In order to investigate whether any differences existed between the three teaching methods at different levels of scholastic ability, 24 analyses of covariance and 36 analyses of variance (one-way) were performed, whereby different covariates and dependent variables were used. In the analyses, 60 althogether, two significant differences were obtained. Considering the fact that this lies within the probability of chance occurrence, it is obvious that the experiment has shown that no differences between the three teaching methods were obtained.

If method differences are considered in relation to obility levels, the only tendency common to the three projects is for the Explicit-English method to rank last at the highest level of ability (level U and course Sk). Tendencies towards overall method differences existed in two of the three part-projects, although they conflicted with each other; in GUME 1 the Implicit method ranked first, in GUME 3 the Explicit-Swedish method. It should be noted, however, that these tendencies were obtained immediately after the experiment; one month later, at the time of the Retest, they did not exist. No interaction between teaching strategy and ability level was obtained.

Brief discussion of course (Sk and Ak) suitability

As has been stated earlier, the pupils in grade 7 belong to one out of two courses in English, one advanced (Sk) and one easier (Ak). Our study gave some interesting results relevant to the much disputed streaming policy, and the following section contains some comments on the problem. We suspect that the problem is not unique for the Swedish school system but has its counterparts elsewhere.

In Sweden streaming has a long history. The various types of selection have usually taken school marks into account, i.e. the pupils have been assigned to different subjects, classes or even schools according to academic criteria. However, recent school reforms have abolished this selection policy because it unduly favoured pupils of advantageous social and economic background. In to-day´s comprehensive school the pupil (and/or his parents) chooses stream and course on his own. The last version of the Authorized Curriculum for Swedish Schools (Läroplan för grundskolan, August, 1969) is very explicit on this point (pp. 34 ff): "Choice of course may be made even if it should conflict with the pupil´s intellectual capacities, such as these are perceived by the school authorities. This means that there are no formal hindrances for admission to the different classes or courses. Nor can a pupil, even if his academic achievements are insignificant, be prevented from following a more theoretical stream through school". In actual practice, courses like Sk and Ak are now abolished in all subjects with the exception of modern foreign languages. In Sweden there has been an intensive debate about the necessity of keeping the above mentioned courses. The following findings may shed some light on the question.

On page 25 it was stated that the streaming of pupils into Sk and Ak is not optimal with regard to IQ. The overlap in IQ scores between the two courses is very large, which also becomes evident from figures 5-7 on pages 68-70 (the overlap is indicated by the shaded area in each figure). There is a striking similarity between the figures for the three GUME projects.

If our measure of general scholastic aptitude ("IQ") were to be used as a criterion for assigning pupils to one course or the other, it is apparent from the figures that it would be difficult to find a good dividing score. We have chosen the intersection between the two curves as the criterion for dividing pupils into Sk and Ak. If so, the shaded area is divided (by the horizontal line through the point of intersection) into two categories of "misplaced" pupils. To the left of the line there are Sk pupils of "low" scholastic aptitude and to the right pupils in Ak of "high" scholastic aptitude. Whether our procedure is meaningful or not depends on the validity of the criterion for selection, i.e. the value of scholastic ability as a predictor of achievement in English. In the table below correlations between IQ and the achievement tests used in the study are given; for comparison the corresponding correlations between Grade English and the achievement tests are also given.

Fig. 5. Distribution of IQ scores, GUME 1, Sk and Ak

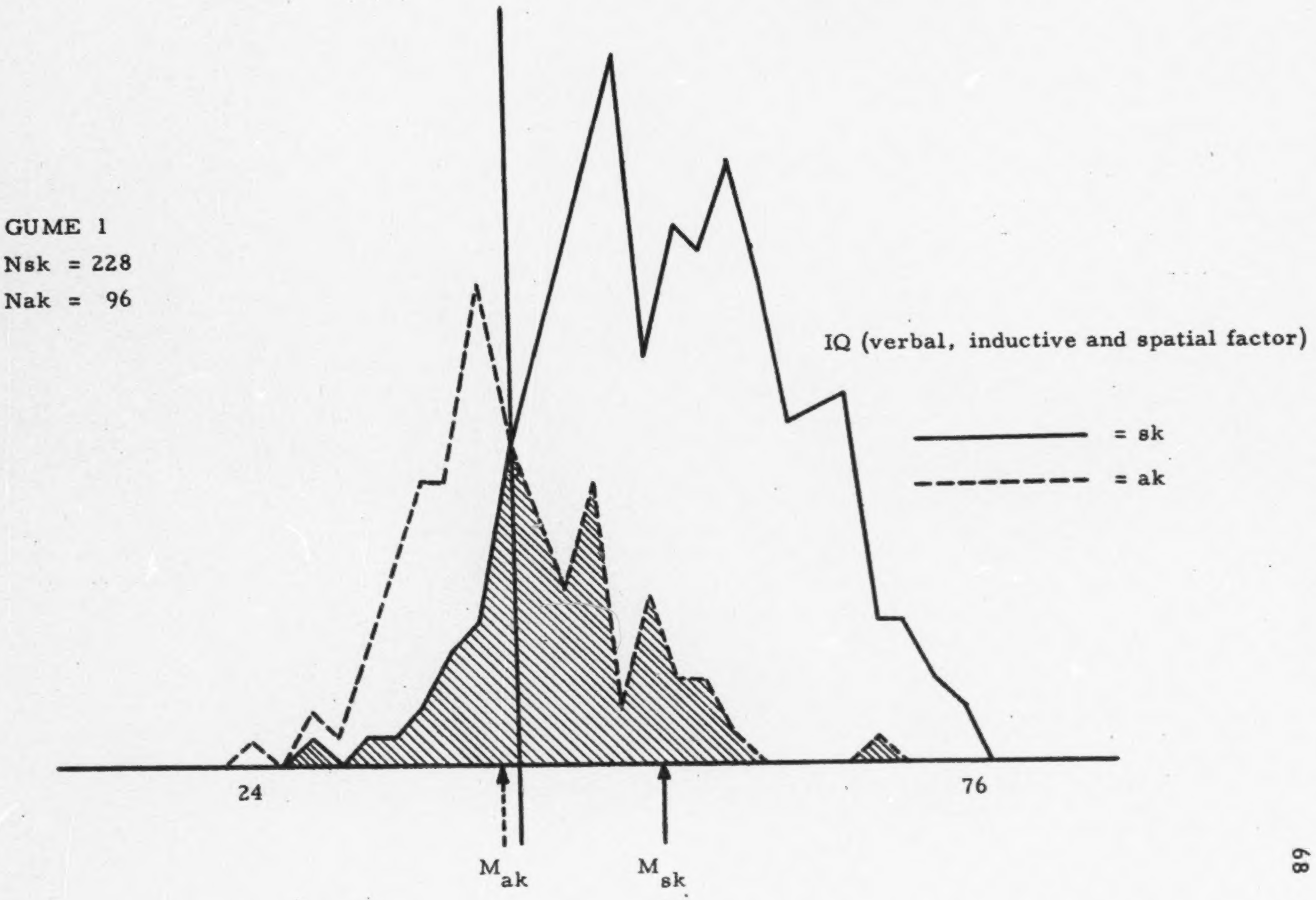


Fig. 6. Distribution of IQ scores, GUME 2, Sk and Ak

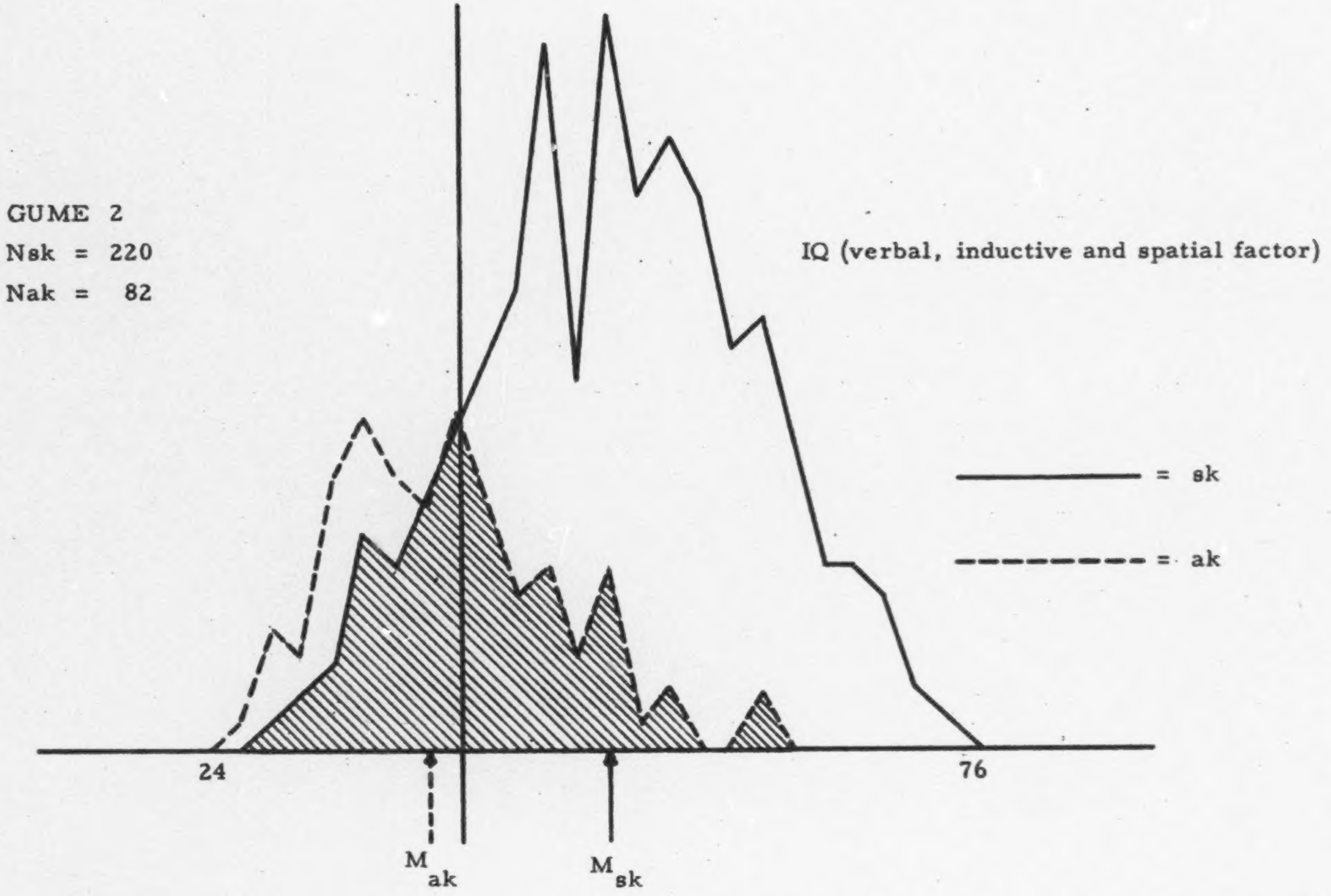


Fig. 7. Distribution of IQ scores, GUME 3, Sk and Ak

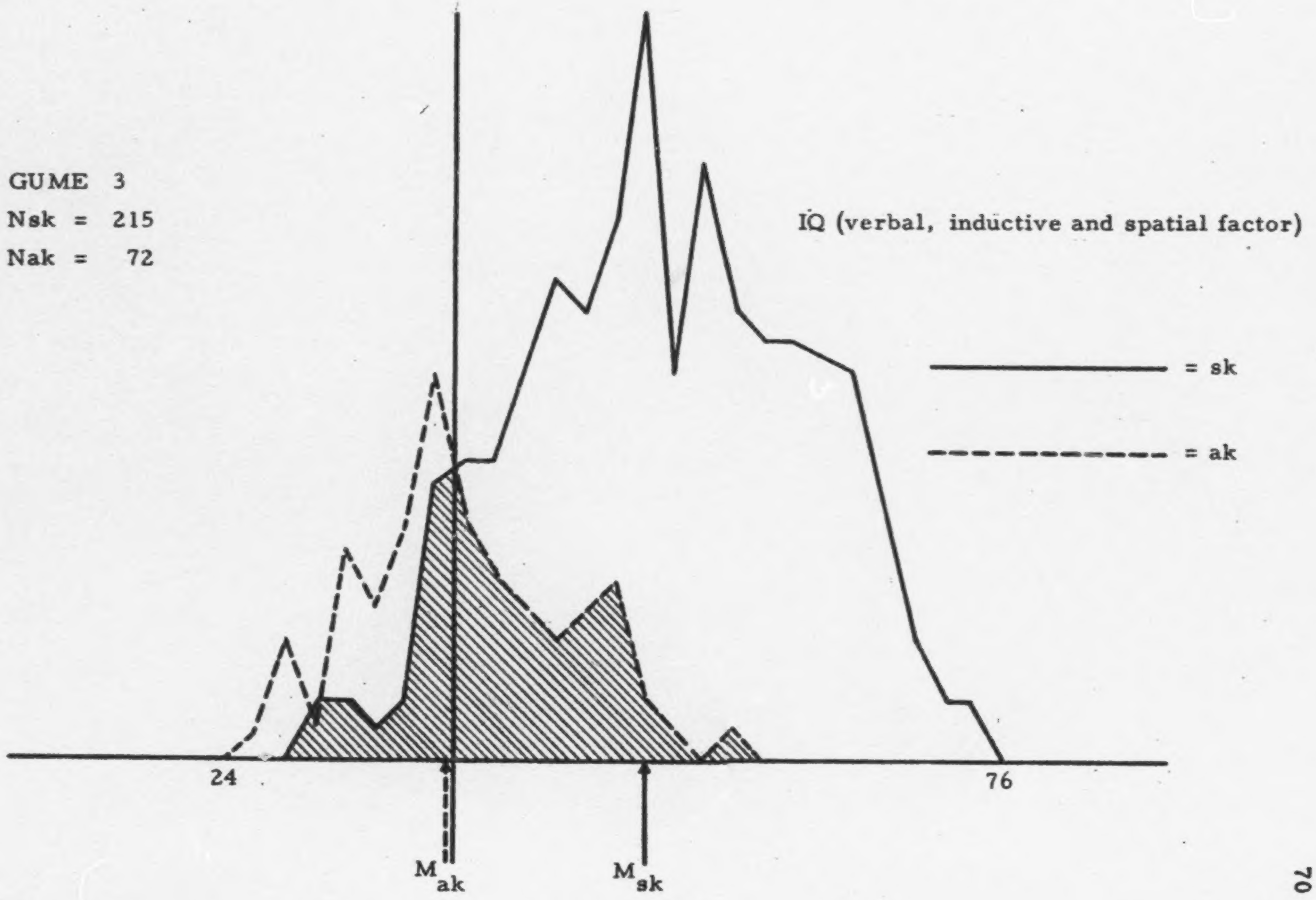


Table 36. Correlations between IQ and GUME tests of English, between Grade English and GUME tests of English, and between IQ and Grade English

	IQ-Pre	IQ-Post	IQ-Re	Grade E -Pre	Grade E -Post	Grade E -Re	IQ-Grade E
GUME 1	.596	.616	.629	.773	.813	.828	.630
GUME 2	.566	.630	.587	.630	.700	.682	.633
GUME 3	.647	.678	.666	.766	.805	.805	.664

It is apparent from the table that Grade English is a better predictor than IQ of success in English. However, IQ correlates substantially with both the tests of English and Grade English, and may be accepted as a criterion for selection of pupils for courses in our hypothetical experiment. The following table illustrates the magnitude of "misplacement" if the pupils were divided into courses according to IQ scores.

Table 37. Students "misplaced" in course according to IQ score

			Sk		Ak	
	N_{Sk}	N_{Ak}	N	%	N	%
GUME 1	228	96	25	11	32	33
GUME 2	220	82	37	17	25	30
GUME 3	215	72	22	10	19	26
Total:	663	250	84	12.7	76	30.4

When Sk and Ak are added together, taking the different number of students in Sk and Ak into account, the total misplacement amounts to 17.5%. It is apparent from the table that most of the misplacement takes place in the easier course. There nearly every third pupil has an intellectual capacity which would give him a good probability of succeeding in the advanced course as here defined (i.e. the area to the right of the line of intersection). Since it can be argued that IQ is a somewhat arbitrary criterion for the selection of students for different courses (see above), we chose the Post-test as an alternative criterion and followed the procedure just described.

The distribution of scores was very similar to that presented for IQ, i.e. the overlap between the two courses was great. For reasons of space we will not present the distributions here, but the following table summarizes the results.

Table 38. Students "misplaced" in course according to the Posttest

			Sk		Ak	
	N_{Sk}	N_{Ak}	N	%	N	%
GUME 1	225	100	23	10	28	28
GUME 2	230	87	29	13	37	43
GUME 3	197	65	11	6	23	35
Total:	652	252	63	9,7	88	34.9

In the case of the Posttest, the total amount of "misplacement" amounts to 16.7%. Here too,most of the misplacement is accounted for by the easier course. More than every third pupil takes the easier course in spite of the fact that he would probably manage the advanced one.

When this hypothesis is put forward, the implication is that he would probably adapt himself to the rate and level of the teaching in Sk, not that he would rank very high in the more advanced cource. On the other hand it could be supposed that a number of pupils in Sk would be well below the mean of Ak if they were placed in that group.

Our calculations overestimate the "misplacements" to some extent, mostly because we assume a perfectly reliable criterion for selection to courses. No matter what criterion is used in actual practice, some overlap will occur that is due to measurement errors. A more conservative criterion that might be used would be to estimate the number of pupils in Ak who exceed the median of Sk, or the number of pupils in Sk who do not reach the median of Ak. The following tables give the figures according to this kind of estimate.

Table 39. Number of pupils in Sk not reaching the median of Ak and number of pupils in Ak exceeding the median of Sk (on the IQ test)

			Sk $< \text{Mdn}_{Ak}$		Ak $> \text{Mdn}_{Sk}$	
	N_{Sk}	N_{Ak}	N	%	N	%
GUME 1	228	96	14	6.4	8	8.3
GUME 2	220	82	19	8.6	8	9.8
GUME 3	215	72	12	5.6	4	5.6
Total:	663	250	45	6.8	20	8.0

As can be seen, the above "misplacement" figures are dramatically lower than those in tables 37 and 38. A total of 65 out of 913 pupils take the "wrong" course, i.e, 7.1%.

A corresponding estimate was made for the Posttest. The figures are presented in the following table.

Table 40. Number of pupils in Sk not reaching the median of Ak and number of pupils in Ak exceeding the median of Sk (on the Posttest)

			Sk $< \text{Mdn}_{Ak}$		Ak $> \text{Mdn}_{Sk}$	
	N_{Sk}	N_{Ak}	N	%	N	%
GUME 1	225	100	9	4.0	0	0
GUME 2	229	87	21	9.2	5	5.7
GUME 3	197	65	2	1.0	1	1.5
Total :	651	252	32	4.9	6	2.4

The amount of misplacement here is even smaller than in the preceding table. 38 pupils out of 903, i.e, 4.2%, take the "wrong" course.

When it was stated that the last criterion was conservative, the implication was that a pupil must be accepted for a certain course even if the probability of his exceeding the median of that course is not 1. Thus the figures in tables 39 and 40 are underestimates of the true misplacement. A presumably fair approximation of the true misplacement would be to say that it lies somewhere between the high figures of tables 37 and 38 and the low figures of tables 39 and 40, i.e. around 20%. The aim of the present discussion is only to point out the existence of misplacement with respect to background variables of importance for foreign language learning, and we shall not further elaborate the estimation principles here.

It is often argued that homogeneous groups facilitate teaching - and learning. As became apparent from figures 5-7 the heterogeneity within both courses is great as far as scholastic ability is concerned. Little is achieved in this respect by having the pupils make their own choice of course. (Note that "assignment", if the term should be used at all, means counselling and recommendations and not a selection procedure). In figures 5-7 the means for Sk and Ak are given respectively. It seems reasonable to assume that the teaching in the two courses can proceed at different rates and levels, although problems of individualization are nearly as great in both.

Our results seem to indicate that the division of pupils into two separate courses is based on other factors than scholastic ability. Both types of "misplacement" mentioned, pupils of high ability in Ak as well as pupils of low ability in Sk, give support to the hypothesis that sociological rather than intellectual factors are decisive.

The aim of any streaming policy is obviously to achieve homogeneous groups. If this were the goal of the Swedish school system, our results demonstrate that the present division into courses in English is not optimal in this respect. It would be a demaning research task to find an optimal combination of criteria for the selection procedure. However, it is clear from the Swedish official curriculum that the main objective is social training, development of an integrated personality, and development of study skills, etc., rather than acquisition of knowledge. In this perspective, considering further the great heterogeneity that exists within the two courses in the two essential aspects investigated by us, not so much is achieved by keeping the two courses separate.

SUMMARY

The GUME project is a comparative study in which three different methods of teaching grammatical structures in English as a foreign language have been compared. Three parallel studies, identical in design, were carried out during the autumn term of 1968 and the spring term of 1969 in grade 7 where Swedish pupils are approximately 14 years of age. Three different areas in the English syntax that are known to cause Swedish students difficulty were selected for investigation:

GUME 1	The do-construction
GUME 2	The some-any dichotomy
GUME 3	The passive voice

The three teaching methods (independent variables) investigated in each of the experiments were:

Im The Implicit method, where the students had systematized drills but no analysis or explanations of the grammatical structures involved.

Ee The Explicit-English method, where the students had systematized drills and, in addition, analysis and explanations in the target language (English). The time allotted to the explanations was taken from the drills.

Es The Explicit-Swedish method, where the students had systematized drills and, in addition, analysis and explanations in the source language (Swedish), comparisons being made with corresponding structures in the Swedish language. The time allotted to explanations was taken from the drills.

In each part-project 18 school classes took part, 6 per teaching strategy. Of these 6 classes, 4 represented the advanced course (Särskild kurs, abbreviated Sk) and 2 the easier course (Allmän kurs, abbreviated Ak). Thus the total GUME project contained 54 classes, 36 in Sk and 18 in Ak. The school classes, representing a wide geographical variation within the Gothenburg area, were randomly assigned to teaching method.

For each part-project 3 lesson series (Im/Ee/Es) were constructed, each consisting of 6 lessons. In order to control the teacher factor, "canned" lessons were used throughout the experiment. The students listened to the programs via headsets with induction receivers. Magnetic wires were installed and tape-recorders used in every classroom; this simple arrangement comes close to a language lab as far as sound quality is concerned.

Since the lesson series are of rather limited length, the three teaching methods were intentionally made somewhat extreme in order to give the independent variables (explanations/non-explanations/explanations in English/explanations in Swedish) a fair chance to "break through".

For each part-project an achievement test in English was constructed. The test was administered on three occasions: as Pretest, as Posttest immediately after the experiment and as Retest approximately one month after the experiment in order to measure retention of treatment.

The pupils' attitudes towards various aspects of the study were collected by means of a questionnaire.

In order to control the comparability between the three experimental populations, a test of "general intelligence" (the verbal, inductive and spatial factors of DBA-Differentiell Begåvnings-Analys = Differential Intelligence Analysis) was given and the pupils' school grades in English, Swedish and Mathematics as well as information as to their social background was collected. The results of this testing and data collection procedure show that the three experimental populations are comparable in all aspects essential to the project.

The results on the Posttest show a substantial increase in learning immediately after the experiment. According to the Retest, the increment remains stable for one month although the particular grammatical structures were not taught in the meantime. Sk is far ahead of Ak at the outset and achieves quantitatively more during the experiment. However, even in Ak the learning increments are large enough for treatment (teaching method) differences, if any, to appear.

In the method comparisons proper the pupils' progress scores are analysed with the experimental populations divided according to two principles. In one type of analysis Sk and Ak are analysed separately, in another the populations are divided into three equal parts according to IQ scores: the Upper third on the IQ test, the Middle third and the Lower third. In Sk and Ak analyses cf covariance are made with different measures of progress as dependent variables and IQ + Grades and the Pretest as covariates. In the case of the three ability levels mentioned, one-way analyses of variance are made with the same dependent variables as in the analyses of covariance. Two-way analyses of variance are performed in order to investigate interaction between teaching strategy and ability level and in order to investigate overall differences between the teaching methods, i.e. without taking ability levels into account.

A total of 60 analyses of covariance and variance (one-way) were performed. In two of them statistically significant differences were obtained, which is less than could be accounted for by mere chance. In the case of two-way analyses of variance, tendencies towards overall differences between methods were obtained in two of the three projects, though the results in the two part-projects point in different directions. No interaction between teaching strategy and ability level was evidenced the study.

Thus the experiment has not shown that any differences exist between the three teaching methods.

DISCUSSIONS OF RESULTS

In the present experiment no significant differences were found between the three teaching methods compared. The survey tables, aimed at illustrating not only significant differences but also "interpretable tendencies", are noticeably empty.

It was stated early in this report that the three parallel projects were regarded as a cross-validation within the total experiment. The idea behind this proposition was that if any independent variable (explanations/ non-explanations, explanations in English/explanations in Swedish) appeared to influence the dependent variable, this would be the case in at least two, but preferably all the three experiments. No such tendency, common to the three part-projects, has been detected. Whether the part-projects are comparable as far as structuring and sequencing of the lessons are concerned, is obviously an open question. Only a meticulous content analysis can answer that question. Until our proposition has been refuted, we consider the projects parallel as regards pedagogical principles. In this perspective the experiment has given contradictory rather than clearcut results in favour of one particular method.

A foreseen criticism of the GUME project is that the teaching situations might be considered unnatural: in the classroom there was no teacher to motivate and reinforce, no one who improvised when the situation so demanded. Disregarding the fact that improvisation cuts both ways, the criticism touches on the question of the real-life quality of the experiment. This is a general problem in research of the kind GUME represents; it has been commented on earlier in the report (see p. 29). Professor Å. Bjerstedt, Malmö, Sweden, has made some remarks on the topic, incidentally in connection with another Swedish foreign language teaching research project (Bjerstedt, 1968, p. 2): "It should be remembered, however, that the demand for real-life-ness must be balanced against the demand for methodological stringency; that one, in order to get interpretable answers to pedagogical questions, is sometimes forced to purify the experimental situation to such an extent that it may appear detracted from the ordinary school setting. This balance is extremely difficult for the researcher to maintain".

One possible explanation of the "insignificant" results in the present study may be that actually existing differences between teaching methods were not detected because of deficiencies in the planning and execution of the project. The three teaching strategies may have been too close to each other in pedagogical respects, the achievement tests may not have been sensitive enough to measure certain increases in learning. The pupils may have taken the experiment as a pastime and have been, therefore, without motivation to learn. The duration of the experiment (6 lessons) may have been too short for actually existing method differences to appear, etc. We shall not try to answer possible criticisms of the experiment (the list could be made longer). We want to point out, however, that the teaching experts engaged in the project, all teachers of long experience, is a good guarantee that the contents of the 54 lessons (3 projects x 3 teaching methods x 6 lessons) were structured and sequenced as well as they could be. At the execution of the project great care was taken to control the experimental situation. "The act of balance", however, has been neither easier nor more difficult than is usual in broad field studies.

It is reasonable, not to say desirable, that objective information from empirical research should be regarded as more relevant than, for instance, undocumented opinions in the current debate. In the intense discussion on foreign language teaching that has taken place in Sweden, re-evaluations of ideas and propositions have been made (the phenomenon has been described as a "struggle towards the middle") although our main impression is that there are still conflicting opinions on pedagogical principles in the field of foreign language teaching. One possible explanation to the clash of opinions is that they are founded on psycholinguistic or language teaching theories rather than on experimental evidence of the superiority of one particular method. To our knowledge no theory of language teaching has proved superior to competing theories. The surveys of relevant research literature that have been made by, for example, Carroll and Smith & Berger also testify to this. Considering the large investments in time, money and people in the Pennsylvania project, it might be described as the "final solution of the foreign language teaching problems". The results of Project 1330, which have been discussed in some detail in the present report, do not point to any teaching method (or language lab system) as the method.

It is our opinion that one should not expect comparative research to run "once-and-for-all definitive experiments" (see the discussion by Campbell & Stanley in Gage, 1963, pp. 173 ff). It is probably wiser to apply a long-term perspective in regarding empirical research as a potential guide in bringing about educational change. The GUME results should be looked upon as a limited part of the information necessary before pronouncements are made as to the best way of teaching English at a particular age level.

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APPENDICES

The appendices contain descriptions of the oral drills and explanations offered as well as an account of the pedagogical principles used in structuring the teaching materials. In one case, GUME 1, the Explicit-English method, the recording manuscripts for the explanations are given as an illustration of the technique used in presenting the explanations.

As it happens, the appendices consist of the relevant text in the three part project reports (see Carlsson, I., Lindblad, T. and Olsson, M. in the bibliography). The present author has taken the liberty of making some cuts so as to avoid repetition.

GUME 1

THE DO-CONSTRUCTION

/Torsten Lindblad/

The lessons

The lessons were to be in three parts: an oral with structure drills, a written for written exercises, and a part for reading and listening practice, each to take roughly 10 minutes. The Im lessons were the starting point: the exercises were composed according to Im principles, i.e. there were no explanations at all. The explanations in the E groups were to be roughly 9 minutes per lesson, or 30%, divided into three 3-minute sections, one in each of the three parts of the lessons. These explanations were to be inserted at a suitable place in the exercise and a corresponding part of the exercise was to be excluded. A graph can be seen in figure A 1. The explanations will be discussed later (page A 6). The actual times for lessons, parts of lessons and explanations in project I can be seen from table A 1.

Since we were interested in investigating the teaching of grammatical structures, not in the teaching of English in general, it was decided that the lessons should be crammed with exercises of the construction under investigation, in this case the do-construction, and that we should not try to teach or to test any gains or losses in the overall knowledge of English.

It was part of this project to see whether it would be at all feasible to try to use transformational rules in teaching the do-construction. I decided to start the series with the third person singular, go on to the past tense and as lesson four take up the other persons with "do". (The first lesson only dealt with how to answer questions.)

All the material that the pupils would need was printed in stencilled booklets, one for each lesson. These booklets were collected after each lesson. The teachers were allowed to keep them if they wanted to, but most of them were just thrown away, without the pupils knowing this, however. Some were kept and gone through to see what the pupils had produced.

Table A 1. Outline of the Lessons of Project 1.

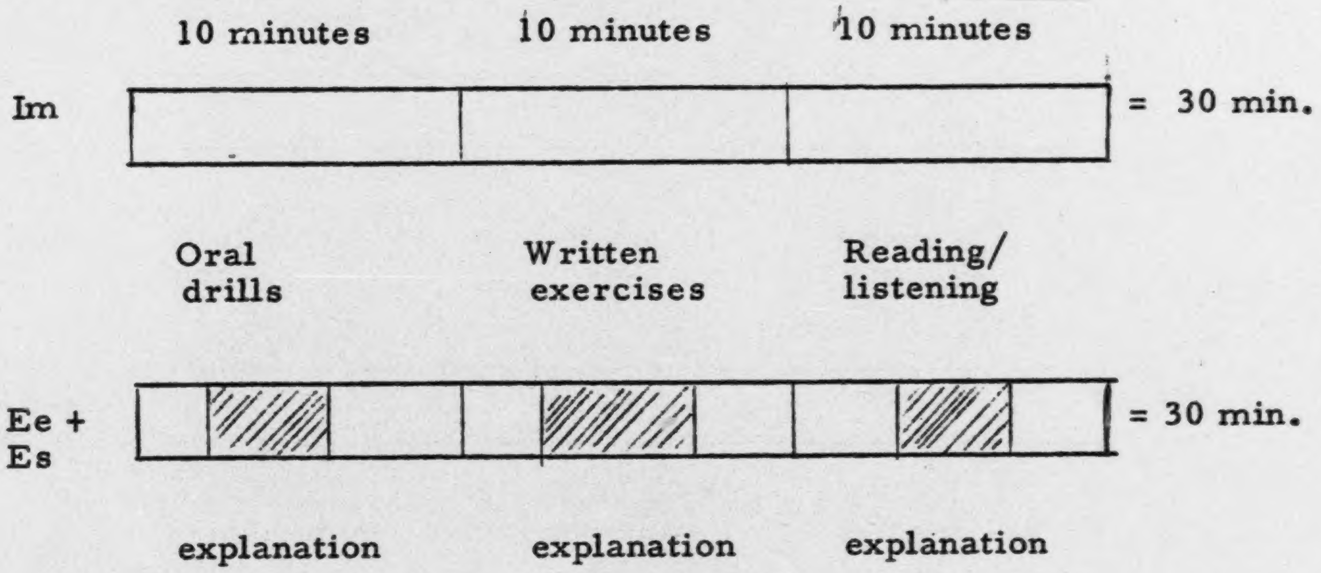
		Introduction	Oral drills	Written drills	Reading drills	Total
1	Im	2.53	10.51	8.14	7.06	29.04
	Ee	3.01	9.17	8.16	8.31	29.05
	Es	2.57	9.06	8.21	7.40	28.04
2	Im		12.42	9.30	7.15	29.25
	Ee		11.58	9.26	8.05	29.29
	Es		12.46	8.49	7.46	29.21
3	Im		14.02	8.55	6.13	29.10
	Ee		10.17	10.29	9.01	29.47
	Es		10.14	10.11	9.03	29.28
4	Im		13.02	10.03	6.03	29.08
	Ee		13.15	8.52	6.37	28.44
	Es		13.47	8.47	6.13	28.47
5	Im		13.41	8.33	7.25	29.39
	Ee		11.38	9.25	8.48	29.51
	Es		12.27	8.34	8.34	29.35
6	Im		13.34	9.39	6.42	29.55
	Ee		10.26	11.01	8.04	29.31
	Es		11.03	10.32	7.55	29.30

Table A 2. Time-table for the Explanations.

In the figures in table A 1 for Ee and Es the explanations are included. Out of the figures given the explanations took:

	A	B	C	Total
1 Ee	3.42	3.00	2.30	9.12
Es	3.28	2.30	1.52	7.50
2 Ee	2.58	2.17	1.43	6.58
Es	3.11	2.13	1.28	6.52
3 Ee	2.25	4.27	2.33	9.25
Es	2.36	3.51	2.44	9.11
4 Ee	1.52	1.50	1.38	5.20
Es	2.21	1.50	1.24	5.35
5 Ee	3.31	3.07	2.00	8.38
Es	3.06	2.42	1.46	7.34
6 Ee	3.02	2.56	1.52	7.50
Es	2.47	2.34	2.05	7.26

Fig. A 1: Theoretical Time-table for One Lesson in the Project.


10 minutes
10 minutes
10 minutes
Im
= 30 min.
Oral drills
Written exercises
Reading/ listening
Ee + Es
= 30 min.
explanation
explanation
explanation

Most of the oral drills used were written by the author prior to the start of the project and meant for language laboratory use. By kind permission from the publisher and the author one or two were taken from Hjelmström's "Speech Drill, Intermediate Stage", and two drills were taken from a language lab programme by Åke Andersson and Anthony Chamberlin, produced for the language lab project sponsored by the Board of Education. The project arrangement with earphones was not to be considered as a kind of language lab for two reasons mainly: the teacher was not supposed to take part in the lesson and check what was going on, and, secondly, no one with any experience of language labs would dream of using the system as we did, i.e. every lesson for as long as 30 minutes and for all kinds of exercises, including written practice and reading texts. The way the earphones were used at the beginning of each lesson for the oral drills, can be said to have been language lab practice of a kind.

One of the principles followed in the construction of these drills was that the pupils should not use any text. There were pictures, however. The complete pupil lesson material has been bound separately and may be borrowed from the author by the interested reader. The tapes of the complete series of lessons are also available in the GUME archives.

The drills were mostly of the four-phase kind (stimulus - pupil's response - correct response - pupil's repetition). Two speakers were used in recording the drills, a man and a woman, both native speakers of English.

Lesson 1: all groups had two oral drills, and the Im group had one more instead of the explanations. The first one practised giving short answers like "Yes, he does", "Yes, they do", "Yes, he was". In the second short questions like "Are you?", "Does he?" were practised. The extra drill used in the Im group only was one made by Åke Andersson and Anthony Chamberlin where simple questions are introduced.

Lesson 2: the groups all had three drills; the Im group had one extra. The first one was a listening drill only, in the second the pupils made questions themselves with the help of a picture sheet (Lesson Materials p. 1), the third came from Svante Hjelmström's "Speech Drill, Intermediate Stage", These were all questions in the third person singular.

Lesson 3: the E groups did one drill only, the Im group two. The first one was based on pictures, practising questions in the past tense.

Lesson 4: there were two drills for the Im group; the E groups did both but in a slightly different way. The first one, based on a large picture, was a telephone call, in which the pupils asked a lot of questions like "Do you ...?". The second was a game, Twenty questions, in which they were to ask an unknown person 20 questions to see if they could guess who he was.

Lesson 5: there were three drills in the Im group; the E groups did one and a half of these roughly. The first one, practising negative sentences like "No, I don´t read the newspaper every day", was based on a picture. The other two were oral-aural only. The pupils reacted to stimuli of different kinds by saying "But I don´t read books ..." and "No, I don´t like tea".

Lesson 6: there were three drills, which practised negative questions and other negative sentences. The Ee group did only the first one, the Es group did one and a half, their explanations being somewhat shorter. The Im group did all three of them. Questions like "Why don´t you like coffee?" and tags like "You went to France last year, didn´t you?" were practised, and also sentences like /Stimulus: I helped you .../ "... but you didn´t help me".

As can be seen from the above description all the groups did the same drills, except that the Im group did more and longer drills to make up for the time spent on explanations in the E groups.

The written drills were all specially composed for the project. The pupils were asked to look up a certain page, instructions as to how this drill should be done were given orally on the tape, one or two examples were done, and then the pupils were given a number of minutes to write. Sometimes they were allowed to go on and do as many pages as they had time for. After this the normal procedure was to read at least a number of the sentences in the correct form so that the pupils could correct their own attempts. Most of the drills were very systematic so that even the Im pupils could see a pattern, even though it was not pointed out to them. Most of them were of the fill-in type, simply in order to save time. If the pupils had been asked to write out whole sentences they would have spent an inordinately long time on things which, from the project point of view, would have been irrelevant.

The reading texts had been written by Mr David Rush, prior to the project, on my instructions, to be used in language lab programmes. These texts deal with the same structures as the programmes or lessons. The idea of these texts as they were used here was to give the pupils some change, to give them an opportunity to meet the constructions in natural surroundings, and also, to give extra listening practice; the texts were recorded by Englishmen who had some experience of this kind of work (Mr Rush himself is a professional writer and actor). These aims were probably achieved exept that the texts were a little too difficult both from the language and the contents and humour point of view. Difficult words were translated in the margin to make reference as quick and as easy as possible. This was felt not to interfere with the strict adherence to an implicit method, since this method is not a direct method in the sense that translations are forbidden; the term Im only refers to the teaching of grammatical structures and occasional translations of words and instructions are not part of the definition.

The Explanations. In the explicit groups the pupils were given grammatical explanations, meant to direct their attention to the problem and to show them what they were doing in their exercises. This combination of "drill and explicit explanation" has, according to Chomsky (1965, p. 51), been claimed as the best method by Wittgenstein. Carroll, on the other hand says (1953, p. 152) that "it may be ... that imitation, practice, and repetition of standard speech patterns will be as effective as grammatical explanations". It should be noted that the pupils were not given grammatical rules that had to be learnt or remembered. Miller's (1964, p. 98) discussion of the terms implicit and explicit and his contention that one must know the rules implicitly are interesting. The explanations were meant to show the pupils how language works so to say, to try to make them see the regularities in the seeming chacs and to give them a perhaps somewhat sounder view of grammar.

The explanations were also meant to help them make generalizations, and whether this had succeeded or not was to be tested some way or other. It may be said in this context that the tests did not only take up sentences that had been practised, and the test thus can be said to fulfil this requirement.

The traditional way of explaining the do-construction can be studied in any of the older school grammars. Some of these are comparative to the point where English is explained with a reference to Swedish ("i frågor med omvänd ordföljd i svenskan"). This seems very unsatisfactory, and moreover I wanted to see if some modification of the transformational-generative grammar could be applied to the teaching of the language (for which it was not meant originally). Experiments with this have, reportedly, been performed successfully elsewhere (e.g. by Professor Owen Thomas in Yugoslavia; oral communication). The difference between the older and the new way of explaining this construction can be illustrated with a reference to Chomsky's (1967, p. 420) figure:

Fig. A 2: The General Structure of a Grammar According to Chomsky (1967, p. 420)

The general structure of a grammar would, then, be as depicted in diagram (13):

(13)

$$\begin{tikzcd}
 & & \text{Semantic representation} & \\
{} \arrow[r, "B"] & \text{Deep structure} \arrow[ur, "S"] \arrow[dr, "T"'] & & \\
 & & \text{Surface structure} \arrow[r, "P"] & \text{Phonetic representation}
\end{tikzcd}$$

> The mapping $\xrightarrow{S}$ is carried out by the semantic component: $\xrightarrow{T}$ by the transformational component; and $\xrightarrow{P}$ by the phonological component. Generation of deep structures by the base system (by the operation $\xrightarrow{B}$) is determined by the categorial system and the lexicon.

The traditional way is to discuss the surface structure, i.e, what the sentence looks like after the transformation (T) has been carried out. The differences between the do-construction in questions and negative sentences on the one hand, and between English and Swedish on the other, are here great. What I have tried to do, is to start from the deep structure level and then show how the transformations change this.

The gains hoped for from this new approach were that the pupils should see the regularities, i.e. the fact that what happens when a statement is turned into a question is in many respects the same as what happens when it is made negative, and that they should be able to generalize and generate sentences that they have not heard and practised. Theoretically at least, these things should be facilitated by this new approach. The diametrically opposed opinions on the value of explanations, represented by men like Politzer and Brooks on the con-side, and Woodworth and Wertheimer on the pro-side, are described by Rivers (1964, p. 120).

In constructing the explanations I thought that is was necessary to give a visual as well as an audial picture of what was happening. A black-and-white representation was not enough, and so other ways were attempted. First I tried to use the overhead projector. This approach was dropped because it was considered impossible for the teacher or assistant to do this easily and in exactly the same way in all classes. Moreover, the number of sheets needed became so large that the operation was very unwieldy. The second attempt was with films. A few films were made but this idea was dropped mainly for two reasons: it became too expensive since projectors had to be bought, and it was technically very unsatisfactory. Professional help would have been too expensive, and the films I made were not of acceptable quality. The third method tried was the one I finally used: side pictures. Colours were used to indicate the various morphemes and operations. The main idea that I wanted to get across to the pupils was the movement of the finite morpheme, which is the explanation why such common mistakes as "Does he smokes?" and "He did not saw it" are impossible.

The second and third explanations in each lesson were built up around one or two pages in the pupils' booklets where a number of sentences were treated in a way similar to that in the slides. The model used was a modified transformational approach of the Chomsky type as presented in the original, "old" form in Syntactic Structures. The main modification was that the finite morphemes were in their "right" positions when the operation started, i.e. after and attached to the verb (e.g. He looks) and not in the Aux position (e.g. He s look). The "s" in this way had to move twice, first to the Aux position in front of the verb. and then from there to the "Q position" at the head of the sentence. This was felt to be a necessary modification and it was also approved by the expert consulted (Professor Ellegård).

The problems dealt with in the project were not all the variations of the do-construction, but only the most important parts. Thus the strongly affirmative do (I do like British food) was not introduced at all and the problems concerned with sentences starting with question words as subject and object respectively (Who saw you? and Who did you see?) were not treated seystematically.

After an introductory lesson with the emphasis on how to answer questions, meant also as an introduction to the project and to let the pupils hear a lot of questions, three lessons were devoted to the question transformaation. I started with the third person, then took preterite forms and finally took what most teachers would quite naturally start with, questions with "do". The reason for this was that I felt it would be easier to use the model of explaining the construction that I had decided on, if there was a finite morpheme they could see. This meant showing how the "s" moved around, next how an "ed" travvelled the same way. See pp A 30 and A 31 for examples of this. In the fourth lesson I then introduced a zero (or "ring" as I called it in the Ee group for simplicity's sake) which then moved in the same manner. The idea was to make the pupils realize that this was a morpheme (this term was never used however) which reacted just as the others did.

The idea of using the transformational approach was, of course, new and unusual and certainly not intended by Chomsky (cf 1967, p. 407), and the teachers, as expected, reacted rather strongly, most of them in a negative way. Only one has said that the explanations were simple and easy to follow.

RECORDING MANUSCRIPTS FOR THE EXPLANATIONS GIVEN IN THE EXPLICIT-ENGLISH GROUP, GUME 1

NOTE. In each lesson three explanations were given; they are called A, B and C in the following manuscripts. In the first explanations of lessons 2 through 6 reference is made to four-colour slides shown in the classes while the pupils were listening. What was on these can be seen from pages A 30 to A 34. The lesson material referred to in explanations 2 and 3 consists of booklets that the pupils were given at the beginning of each lesson and with which they worked.

Lesson 1

Group: Ee

A

Now I want you to look up your papers. The first green page there is called "sidan A". Now we shall try to see how English people do when they answer questions in English. It is quite easy really, but we shall look at it anyhow, so that you know it really well when we go on to more difficult things next time. When you answer "yes" to a question, you normally repeat the verb of the question, so if I ask you "Can I do it?", then you would say "Yes, you can". If you hear the answer only, you can almost guess what the question must have been. Look at number two here. If somebody answers "Yes, you must", then you can know that somebody else asked him "Must I" and in this case here "Must I do it?". Now write the answer of the next question. "Shall we do it?" - "Yes, we -", good, of course you must say "yes, we shall." And if the answer is "Yes, he will", then the question must of course be "Will he do it?". The only words that are changed are "am" and "are" when you speak about yourself or to one other person. Then you say - as you can see here - "Are you ill? - Yes, I am. - Am I tall? - Yes, you are." "Is" and "has" are of course repeated. Then we come to questions beginning with "do" and "does". These words are also repeated, so you say "Yes, I do" and in the next one of course "Yes, she does". The question of the next one must be, well, what do you say - good, "Did they see it?". - Now, if you want to answer no, you just add not to all these little verbs and say "No, I can´t, I don´t, he doesn´t". But then if you want to say a little more and give the right answer also, then you must repeat the full verb of the question, verbs like "speak, like, sing, look". Now look at the questions and answers and say after me: "Do you like coffee? - No, I don´t, but I like tea. - Does he sing pop songs? - No, he doesn´t, but he sings folk songs. - Did they look at it? - No, they didn´t, but they looked at the book." Notice that you must be careful to get the "s" and the "e-d" in the right place as in "Does he sing?" - "No, he doesn´t but he sings" - "Did they look?" - "No, they didn´t, but they looked", - Fine, now we´ll go on with our little exercise and we´ll see if you remember what I have just told you so that you can answer correctly.

B

Now turn the page all of you and look up the green paper called "sidan 1 A". Look at the examples there. We'll read them together and you write the words that I have left out. 'Can I do it?' and the answer 'Yes, you must', the question must be, well -- 'Must I do it?' Now answer the next one and write it out: 'Are you ill?' -- 'Yes, I am.' And what must the next question be as the answer is 'Yes, you are'? That's right, it must be 'Am I tall?'. So, the only verbs that are changed are "am" and "are" when you speak about yourself or to one person. And then we have two questions with "do" and "does". You answer them, please: 'Do you like milk?' -- 'Yes, I do'. And 'Does he love Mary?'-- 'Yes, he - does'. Good. And then we'll look at the three questions to which you answer "no", and then go on to tell the person who asks the question what the right answer is. Notice that in the first short answer you repeat the little verb "do, does, did" as we have done before, but then when you say the right thing, you must use the full verbs "like, speak, look". Notice the "s" and "e-d" that you must put on the end of these verbs here. Will you say after me please: 'Do you like coffee?' ///// 'No I don't, but I like tea.' ///// 'Does she speak French? ///// 'No, she doesn't, but she speaks English'. ///// 'Did they look at the boy?' ///// 'No, they didn't, but they looked at the girl.' ///// Before we leave this, you can underline in the questions "do, does, did" and the full verbs "like, speak, look". And then in the answers, "don't, doesn't, didn't and the three verbs "like, speaks, looked". That's fine, now you can go on writing, and try to remember what we have talked about here.

C

Now, will you stop for a minute. Turn the page and look up the green paper. There you find the beginning of this same story again. We shall look at some of the sentences. I have underlined them for you, so that you can find them quite easily. When the actor says "Yes, I am" you can't understand what he means, if you haven't heard what the agent said before. So we have to go back and look at what the agent said. Follow the arrow and you come to "you're looking for work". So "Yes, I am" means "Yes, I am looking for work". Now I want you to write that on the line to the right there on your papers. ///// And then when the actor says "Yes, you did" we have to go back again and see, and then we find that the agent has said "Did we explain", so "Yes, you did" means - listen - "Yes, you explained". Now write that on the line to the right on your paper. ///// Then he says "Yes, it does". Can you tell me now what you must write on the line here? - Good, of course it means "Yes, it sounds all right". ///// And then, what does "Yes, I can" mean? - Good, it means "Yes, I can ride a horse". ///// And the next "Yes, I can"? - That's right: "Yes, I can swim". ///// And finally, what does "Yes, I did" mean? - That's correct: "Yes, I went to a training school". ///// And now I want you to go on reading the story. Turn back to the white page again.

Lesson 2

Group: Ee

A

Now we shall try to see what you really do when you ask a question in English. But first let us start with four English sentences (1). - Oh no, that can't be right, you can't say that in English. We must add something. (2). - That looks better. Let's read these sentences: He looks, He can look. But then, no that is still not correct. We must add a little more (3) - like that. Now: He looks, He can look, He has looked, He is looking. They are four correct English sentences. But now we'll make them into questions. Let us start with the question marks (4) like that. We'll put one in front of the sentences too. Now we must change something because these are not correct questions. We'll put the red words in a frame (5) because it's with them that we must do something. We must move them to the beginning of the sentences (6) as the arrows show us. In English the black words can never change places. But now there is no red word in the first sentence, so we'll move the s first (7) as this arrow shows and then it looks like this (8). Now let us move the words in the frame to the beginning of the sentences, where the question mark is, like this (9). Now we have three fine sentences, three questions: Can he look, Has he looked, Is he looking. But the first one is no good, you can't say that: s he look. What we must do now is to add something to the s. Let us do as English people always do, let's take the word do. We'll have to spell it d- -e (10) and what we get is this: Does he look. Now we'll read these sentences together: Does he look, Can he look, Has he looked, Is he looking. Good.

B

Now turn the page all of you and look up the green paper called "sidan 4 A". We´ll see if you remember what we said a little while ago when we looked at the pictures. When you make sentences into questions you add a question mark after it, but then you must also move the little verbs "can, has, is" to the beginning of the sentence just as you can see on your papers. The two words "he" and "look" must stay where they are, you just move "can, has, is" and so you get the three questions ´Can he look at it?, Has he looked at it?, Is he looking at it?´. But the full verbs "looks, sees, eats, drinks, takes" must stay where they are as we have said before. It´s only the "s" that moves, and it goes into the empty frame to the same place as "can, has, is", and then this "s" moves to the beginning as these little verbs. And as you can´t start a sentence or question with just an "s", we´ll have to put it together with the verb do, and so we get the word "does" which we spell "do-e-s". This little verb "do" takes the place of the little verbs "can, has, is", and we can say that in English when you ask a question you must put a little verb like "can, has, is" first, and if there is no such word, then you must add the word "do", because words like "look, see, eat" and so on can´t move to the beginning. - Now look at the last two lines of the page. This is the same thing. And you can see here that the "s" of "sees" goes to "do" and makes the word "does" and therefore you can´t have an "s" on the word "see" in the question, so you say "Does Peter see his sister?". And now go back to page 4 again and go on writing.

C

Now, will you stop for a minute and turn to the green page. There you find a little bit of the same story. It's the woman and the solicitor talking to each other. I have underlined some of the questions here. We have practised quite a bit making sentences into questions. Here we'll do it the other way. Look at the first question: "Does he grunt in a special way?" What would "Does he grunt" be as an ordinary sentence? - That's right, "He grunts". I want you to write that on the line there, under the question. This is what you could say in an answer, for example: "Does he grunt?" - "Yes, he grunts". ///// Now look at the next question: "Does he sound hurtful?" What must you write there? - Good, you should write "He sounds hurtful". ///// And then the next one: "What time does your train go?" There you must write, well - "Your train goes". ///// And then "Does he have to do any more than that?" - "He has to do more". ///// And finally: "what does he say?" - where you write - well - "He says something." - That's fine, now you can go back to the white paper and go on reading the story.

Lesson 3

Group: Ee

A

Now we shall see again how you do in English when you ask questions, but today we shall talk about sentences telling us what happened yesterday or a year ago. Let's look (1). Oh, here are those four sentences again. But you can't say that, can you? Let's add something again (2). That's better: He looked, He could look. But then, no, we'll have to add more (3). Now: He looked, He could look, He had looked, He was looking. That's fine. And now we'll make questions (4) and we add question marks as we did last time. And again something, in fact exactly the same thing as last time, will happen to the red words, so let's put them in a frame again(5). When we ask questions, the red words go to the beginning of the sentences, look at the arrows (6). But again, the first sentence is no good, there is nothing in the frame there. Let's move the -e-d into it (7) as this arrow shows, like this (8). And now we must move it all to the front (9) and we get three, but not four fine sentences: Could he look, Had he looked, Was he looking. But the first one lookes strange. You can't say that: ed he look. We'll do as we did last time, we'll add "do" (10) like this. That looks better but still not correct, because you don't say do-ed in English. Let us change it a little bit (11) like this. And now we have four correct questions. Say after me please: Did he look, Could he look, Had he looked, Was he looking. Good.

B

And now I want you to stop writing for a minute. Turn the page and look at the first green paper called "sidan 5 A". We'll look at a few sentences to see if you know what you must do now when you ask questions in English As you see there is no problem in the first three sentences. It's just the same as last time: you just take the little verbs "could, had, was" and move them to the beginning of the sentences, and so you get the three questions 'Could he look?, Had he looked?, Was he looking?'. In the other two sentences you can't start - as we said last time - with words like "look" and "ask". What we have to do is to add something between "he" and "look", so we'll move the "e-d" just as we moved the "s" last time, and then we move this "ed" to the beginning of the sentence just as we do with "could, had, was" and when we add "do" we get the word "did". Since the "e-d" of "looked" and "asked" has moved over to "do" we must say "look, ask" in the questions. 'Did he look at her?' 'Did he ask her something?'. That's fine. You noticed now, didn't you, that we say 'He looked' but 'Did he look?' and 'He asked' but 'Did he ask'. - Now turn the page and look at "Sidan 5 B". In English we say "I like it now" but "I liked it yesterday". So you add "e-d" when you want to say that something happened yesterday, a week ago or last year. You don't always spell it that way. As you can see here, when "like" and "ed" are made into one word, one "e" is dropped. Look at the second sentence. There you can see that instead of "say" and "ed" you spell it "s-a-i-d" but it is the same as "say" + "ed" as I have written over it. "Do + ed" as you already know is "did". "Send + ed" becomes "sent". And then notice the last three words: "see + ed" is "saw", "drink + ed" is "drank" and "take + ed" is "took". This is important when we make questions. As you remember the "ed" goes to the beginning and makes the word "did", so that when you ask about something that happened yesterday you always start with "did", but then the full verb must be "like, say, do, send, see, drink, take". Now I'll read the sentences to the left and the questions. Listen carefully 'He liked her new hat.' 'Did he like her new hat?' 'He did his homework'. 'He sent her a letter.' 'Did he send her a letter?' 'I saw him yesterday.' 'Did I see him yesterday?' 'He drank his tea.' 'Did he drink his tea?'

'He took his books.' 'Did he take his books?'- And now finally we'll look at the two last sentences of the page. When wou have a sentence with the word "do" or "did" in it, notice what happens when it becomes a question. The "e-d" goes to the beginning where we put in a new "do" which then becomes "did" and of the first word there is just "do" left, so we say 'He did his homework' and 'Did he do his homework?' - And now you can go back to page 4 and go on writting.

C

Now I want you to stop reading a minute. Look up the green paper called "elevblad 2" and look at the sentence there. If we have a sentence like "You said something" you can make that into a question in two ways. First as we have done before. Then you put a "did" in front and get "Did you say something?". But then you can make a question out of "something" also and ask about that too. Then you put it at the beginning before "did" and then you must change it and say "what", and now you get the sentence to the right on your paper: "What did you say?" That's quite easy really. Look at the next one. "He did something then" becomes "Did he do something then?" and then you can put "something" first and say "What did he do then?". And look at the next one. "He hit you somewhere" becomes first "Did he hit you somewhere?" and then if you don't know where he hit her but want to know "Where did he hit you?". Now I want you to write in the following four sentences. "He saw me there" first becomes "Did he see me there?" - Write that, please. ///// And then you want to ask about where it was. Now you put "there" fist, but then you must spell it with "w-h" and so you get "Where did he see me?" ///// And the next one. "He gave her something". Can you write the two questions yourself? - Right, it must be "Did he give her something?" and "What did he give her?" ///// And the next one. "I did it then" becomes first - "Did I do it then?" and then "When did I do it?" ///// And the last one. "You saw somebody" becomes "Did you see somebody?" and "Who did you see?". - ///// - And now before we leave this, notice the two sentences with the verb "do" in them. "He does it" as a question becomes "Does he do it?" and "He did it" becomes "Did he do it?". - Now go back to the white papers and go on reading your story.

Lesson 4

Group: Ee

A

Today we shall learn a little more about how to ask questions. We'll start with our four sentences (1), and they are still not correct, so we'll add what we have added before (2) and then they are all right: We look, we can look, we have looked, we are looking. And when we make them into questions we do as before (3), we add the question marks, the frame and the arrows. But as always there is trouble in the first sentence. There is nothing in the frame, but now there is nothing outside it either, so we'll have to add a ring which means nothing (4) and move it into the frame (5). This ring shows us that what we do now is exactly the same thing as we have done before. And now we'll make the questions (6) like this. As always we get three correct questions: Can we look, have we looked, are we looking. But the first one is no question: we look. And we have this ring. Let's do as we have done before, let's put in Do there (7) and do plus nothing is do of course, so we get four questions: Do we look, Can we look, Have we looked, Are we looking. Good. Now remember this when you go on with the exercises.

B

And now, please turn the page and look at the green paper called "Sidan 7 A". Here are a few more sentences that we shall make into questions. The first four are quite easy as usual. You just take the little verbs "can, have, were, am" and put them at the beginning of the sentences and so get the questions "Can we do it?, Have you looked at it?, Were they there?. Am I a teacher?. In the next four sentences, however, the full verbs "speak, live, drink, play" must stay where they are. In the other lessons we have moved an "s" and "e-d" from these verbs to the empty frame and then as the little to the beginning. Now there is nothing after them, so we´ll have to move an empty little ring to the beginning, and of course add "do" as we always do. And of course "do" plus nothing becomes just "do". So in a way these are easier than the questions we have practised before. Let´s read these questions now. ´I speak English well.´ ///// ´Do I speak English well?´ ///// ´We live in Sweden.´ ///// ´Do we live in Sweden?´ ///// ´You drink milk every day.´ ///// ´Do you drink milk every day?´ ///// ´The Beatles play pop´. ///// ´Do the Beatles play pop?´ - Now try to remember this when you go on writting. Turn back to page 7 and go on there.

C

Now stop reading for a minute and look at the green paper, called "elevblad 2". Here you have the beginning of the dialogue again, but here I have underlined five questions. And in the questions I have put one or two words in a frame. You can make a new question now in which you ask about this word, questions like those that we practised last time and that begin with the words that I have already written on the lines for you. "D´ you come here often?" of course means "Do you come here often?", and what question can you make of that, starting with "When"? - That´s right: "When do you come here?" Write that there, please. ///// And then "D´you like this band?" What can you say, starting with "What"? - Right: ´What do you like?" ///// And then: "D´you think I dance well?" becomes - well? - "How do you think I dance?" ///// And then "D´you mean it?" which becomes - "What do you mean?" ///// And finally: "Do I look all right?" which becomes - "How do I look?" ///// That´s right. Now go back to your white papers again and go on reading the story.

Lesson 5

Group: Ee

A

Today we shall do something new with our four English sentences. But let us start with them as before (1). Now they are correct at once: He looks, he can look, he has looked, he is looking. That is fine. Now we shall see what happens when we put in the word not in them (2). Let us put it up there and down at the bottom to begin with to remember that we must put it in somewhere. When we do this something again happens to the red words, so let us put them in frame, as we have done before (3) like this. Now, in English the word not always comes in after the words in the frame, so let us put it in there, one not in each sentence (4). What we get here is all right if we read the last three sentences: He can not look, he has not looked, he is not looking. But, the first one, as always, is more difficult. There is nothing in the frame there, so we must move the s (5) as we have done before, like this (6). But you can´t say that, can you: He s not look. But, now you all know what to do, don´t you? Of course, we must put in the word do, and now we get (7) four correct sentences: He does not look, he can not look, he has not looked, he is not looking. That is fine. As you know, we sometimes don´t say not but just n´t as in doesn´t, hasn´t, and we can also spell it that way. In fact, it´s more common to say it, and spell it, that way. These sentences here are correct but we can also say (8). He doesn´t look, he can´t look, he hasn´t looked, he isn´t looking. Notice that n´t must go into the frame then to the verb. - Now let us go back to the beginning again (9) and see what happens when we talk about what happened yesterday. Then we say: He looked, he could look, he had looked, he was looking. Now we´ll put in not (10) and then we get these four sentences with not after the frame again. In the first line there is nothing in the frame, so the e-d has to move in (11), and as you remember from before, when we add do we get did (12) like this, and now we have the four sentences He did not look, he could not look, he had not looked, he was not looking.

B

And now will you stop that for a minute and turn to the green page called "Sidan 3 A". When we made questions we noticed that sentences with little verbs like "can, are, was, would" were much easier that other sentences. Today, when we put in a "not" in our sentences we notice the same thing. That is why I have put all these little verbs in a frame again. You just put in the word "not" after these words. In English you quite often use "n´t" instead. This word also come after the little verbs, but we must write them together and therefore we put it in frame where the other words already are. This last way of doing it, to use an "n´t" is more common. That is why "I can not do it" is in parenthesis. What you should normally say is "I can´t do it". Listen to me now. I´ll read these sentences: ´I can do it. - I can´t do it. - They are here. - They aren´t here. - He was ill. - He wasn´t ill. - She would do it. - She wouldn´t do it. ´ - But the next four sentences, as always, are more difficult. Here we have the full verbs "look, see, looked, saw" and not can´t stand behind these. We put in an empty frame between "we" and "look" where "can" could have been and then we put in "not" after it or "n´t" into it. And then we must move the ring, the "s" and the "e-d" into the frame and add the verb "do" just as we did when we were making questions. And then we get the following sentences, and now I want you to say after me, please: ´We look at it.´ ///// ´We don´t look at it.´ ///// He sees it. ´ ///// He doesn´t see it.´ ///// ´We looked at it.´ ///// ´We didn´t look at it.´ /////´They saw the girl.´ ///// ´They didn´t see the girl.´ ///// - And now you try to remember this. Notice that the "s" and "ed" of the first sentence goes over to the verb "do" so that you say "He sees" but "He doesn´t see" and "We looked" but "We didn´t look". Now go back to page 3 again and go on writing.

C

Now I want you to stop reading for a minute. Look up the green paper called "elevblad 2". Here you have a little bit of the story again, and here I have done as before. I have underlined some things that I want you to look at a little bit extra carefully. The Candidate, Mr Culpepper asks ´D´you see what I mean?" and the Interviewer answers "I don´t". What he means is of course: "I don´t see what you mean". The word "see" must be used there. Therefore I have put it in a frame. Now I want you to write this long answer on the line to the right: "I don´t see" - we can leave out the rest. ///// And then if we go on, we come to "And your wife lives with you of course." and the answer "No, she doesn´t" which means "No, she doesn´t live with me". Write that, please. ///// Now if we go to the next one perhaps you can tell me what you should write on the line: "You don´t normally live apart" - "No, we don´t"? - That´s right: "No, we don´t normally live apart." ///// And the next one: "Does she know of your application?" - "No, she doesn´t". What must you write now? - "No, she doesn´t know". ///// And the last one "But surely you write to each other" - "No, we don´t". There we´ll write - well? - "No, we don´t write to each other". ///// Fine, and now go back to your whitepapers and go on reading.

Lesson 6

Group: Ee

A

We have learnt in the other lessons what happens to an English sentence if we make it into a question, and also what happens when we put in not in it. Today we shall try to do both at the same time. Let's start with the same four sentences as before (1): He looks, he can look, he has looked, he is looking. And then we put in not and add question marks (2) at the same time. What happens? Well, to begin with we must do something about the first sentence, where the red letter s is in the wrong place, like this (3). As we have already learnt, this is not correct English, we must do a little more, we must add the word do, and then we get (4) four correct negative sentences: He does not look, he can not look, he has not looked, he is not looking. But still they are not questions. What must we do? - Of course, we must move all the words in the frame to the beginning of the sentences (5) like this. And when we do that we get four fine English questions (6). Does he not look, Can he not look, Has he not looked. Is he not looking. And that is correct English. You can say it that way. But as we said last time you can also say n't instead of not, and this, as we also said, is more common. Let us see what happens then. We'll go back a little bit (7), here we are: he does not look, he can not look, he has not looked, he is not looking. Instead we can say (8) - and now notice that n't goes inside the frame as we said last time - he doesn't look, he can't look, he hasn't looked, he isn't looking. And now we make questions as before (9) and move the frame to the beginning, but now the little word n't is in it so what we get is (10) Doesn't he look, Can't he look, Hasn't he looked, Isn't he looking. Now go on with the following exercise and try to remember this. Then you'll get the sentences right.

B

Now turn the page for a little while and look at the green paper called "Sidan 2 A". You remember the pictures we just looked at,I hope. This is the same thing. We have a sentence like "He can sing". When we put in a "not" we get the sentences that you have at the top of your paper here. We say "He can´t sing" or sometimes "He can not sing". "She has been there" becomes "She hasn´t been there" and if you go down to example four here, you remember that "He sings well" must become as we have it here "He doesn´t sing well". - "I saw him" becomes - look - "I didn´t see him" and "He took it" "He didn´t take it". Now we shall make questions of these sentences. As you remember from last time we can put in a "not" which we put after the frame, or an "n´t" which we put in the frame, just as I have done here. Notice that "not" is not in the frame but "n´t" is. When we make questions now, the frames must go to the beginning of the sentences, and then you get the sentences or questions to the right on your paper: ´Can´t he sing?´ which is the normal way of saying it, or ´Can he not sing?´ which is not so common but quite correct. If I read the sentences to the left, , will you then read the questions to the right, please: ´He can´t sing.´ ///// ´Can´t he sing?´- She hasn´t been there.´ ///// ´Hasn´t she been there?´ - ´We aren´t looking at it.´ ///// ´Aren´t we looking at it?´ - When we come over to the next three, those that are always so difficult because there are full verbs like "sing, see, take" in them, you notice that the difficulty comes in when you put in "not". When you have done that, as we have on this paper, it isn´t very difficult, because now we have a little verb, "do", which can go to the front and which takes "n´t" with it. Let´s read these too: ´He doesn´t sing well.´ ///// ´Doesn´t he sing well?´ - ´I didn´t see him.´ ///// ´Didn´t I see him?´ - "We didn´t take it.´ ///// ´Didn´t we take it?´ - Good, and now go back to page 2 and go on writing and try to remember this. Good luck!

C

Now stop reading for a minute, will you, and turn to the green paper called"elevblad 2" and look at the sentences there. As we have said before, you can ask questions in three ways in English. One of them is the common kind that we have practised so much, the other two are the tags, the little questions that you hang on the end of ordinary sentences. If there is a "not" in the sentence, then you can´t have a "not" or "n´t" in the question, but if there is no "not" in the sentence, then the question must have "not" or "n´t". Look at the first four sentences here and say after me: ´I couldn´t do anything else, could I?´ ///// ´Well, you could have waited, couldn´t you?´ ///// ´You don´t want them to waste the whole day, do you?´ ///// ´You know it is, don´t you?´ ///// These sentences all come from the story you are just reading. Now we shall try to make four sentences ourselves. What must the first one be? Right: "I have a book, haven´t I?" Write that out, please. ///// And the next one? - "I can´t do it, can I?" ///// And the next one? - "You don´t drink beer, do you?" ///// And the last one? - "You like milk, don´t you?" ///// - Now look at the six sentences at the bottom of your paper. They all come from the story. Notice that they are all questions and that there is an "n´t" in them. When you go back to your white papers now and read the story, look out for sentences like these, questions with a "not" in them.

Good luck!

Ee and Es: Lesson 2

Manuscript for Slides

1

he	look
he	look
he	look
he	look

2

he		looks
he	can	look
he	has	look
he	is	look

3

he		looks
he	can	look
he	has	looked
he	is	looking

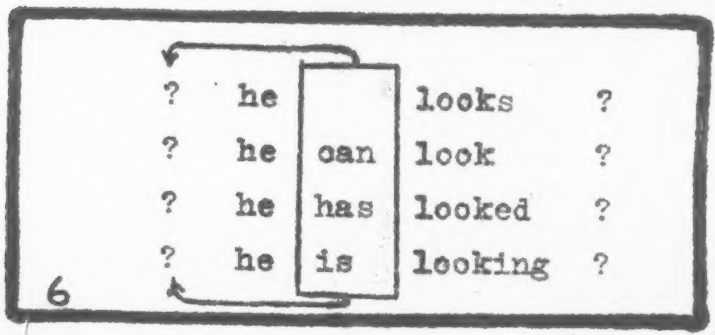
4

?	he		looks	?
?	he	can	look	?
?	he	has	looked	?
?	he	is	looking	?

5

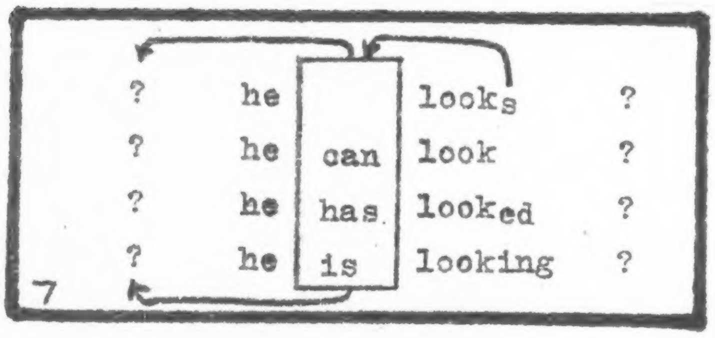
?	he		looks	?
?	he	can	look	?
?	he	has	looked	?
?	he	is	looking	?

6



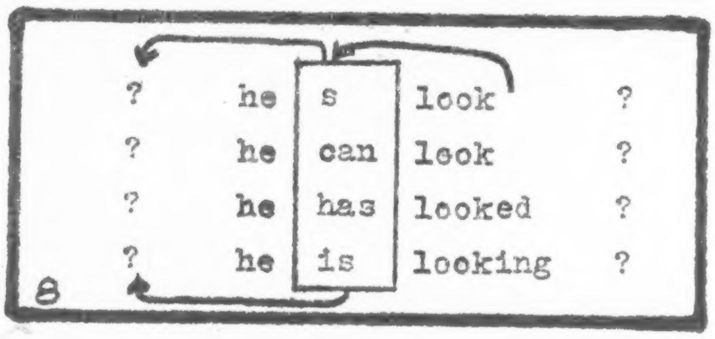
?	he		looks	?
?	he	can	look	?
?	he	has	looked	?
?	he	is	looking	?

7



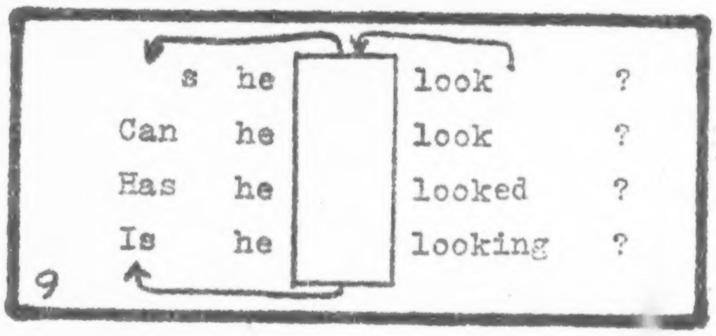
?	he		looks	?
?	he	can	look	?
?	he	has	looked	?
?	he	is	looking	?

8



?	he	s	look	?
?	he	can	look	?
?	he	has	looked	?
?	he	is	looking	?

9



s	he		look	?
Can	he		look	?
Has	he		looked	?
Is	he		looking	?

10

Does	he	look	?
Can	he	look	?
Has	he	looked	?
Is	he	looking	?

he	look
he	look
he	look
he	look

1

he		looked
he	could	look
he	had	look
he	was	look

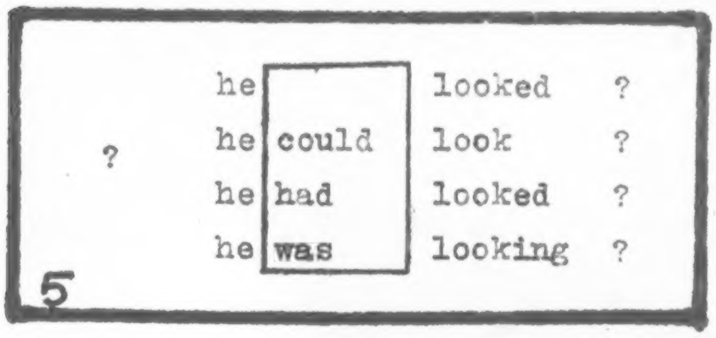
2

he		looked
he	could	look
he	had	looked
he	was	looking

3

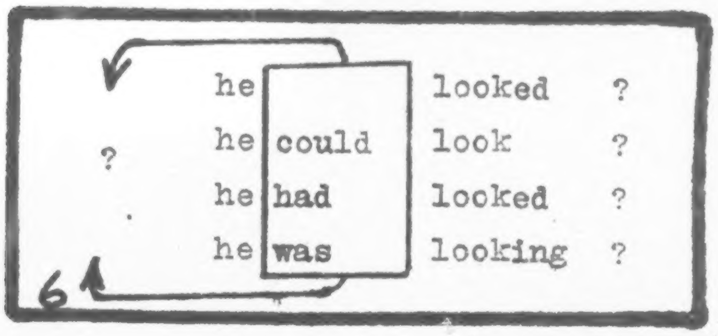
	he		looked	?
?	he	could	look	?
	he	had	looked	?
	he	was	looking	?

4



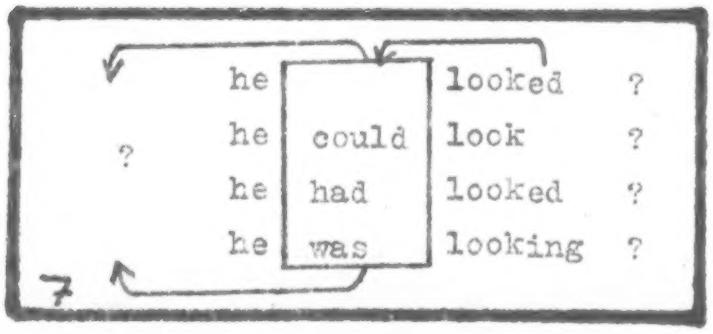
	he		looked	?
?	he	could	look	?
	he	had	looked	?
	he	was	looking	?

5



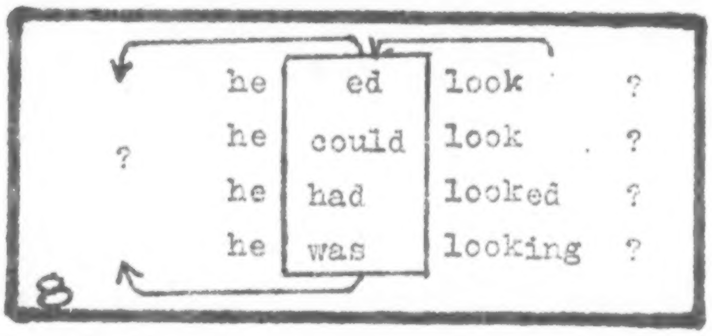
	he		looked	?
?	he	could	look	?
	he	had	looked	?
	he	was	looking	?

6



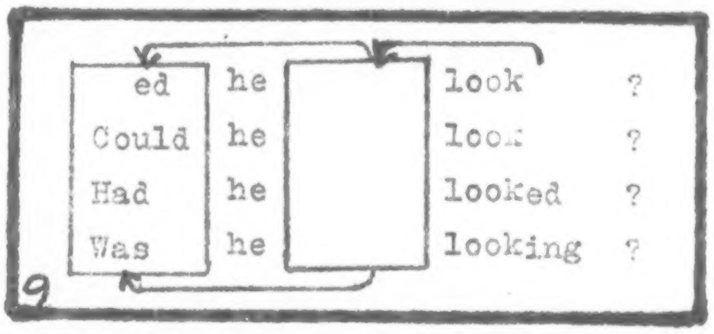
	he		looked	?
?	he	could	look	?
	he	had	looked	?
	he	was	looking	?

7



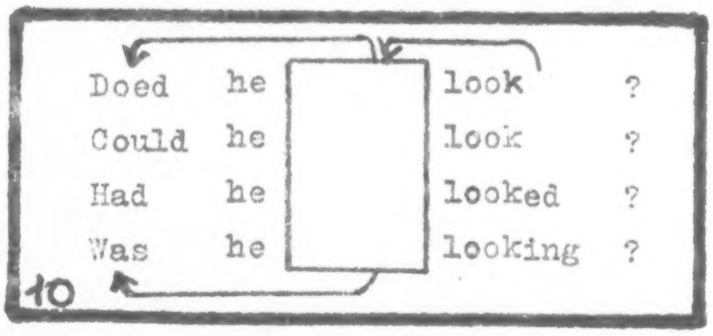
	he	ed	look	?
?	he	could	look	?
	he	had	looked	?
	he	was	looking	?

8



ed	he	look	?
Could	he	look	?
Had	he	looked	?
Was	he	looking	?

9



Doed	he	look	?
Could	he	look	?
Had	he	looked	?
Was	he	looking	?

10

Did	he	look	?
Could	he	look	?
Had	he	looked	?
Was	he	looking	?

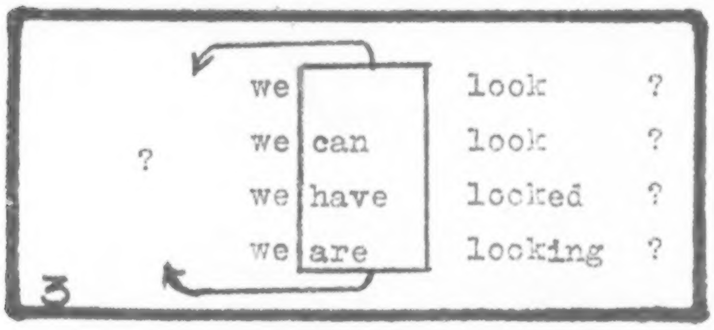
11

Be and Es: Lesson 4 A 32

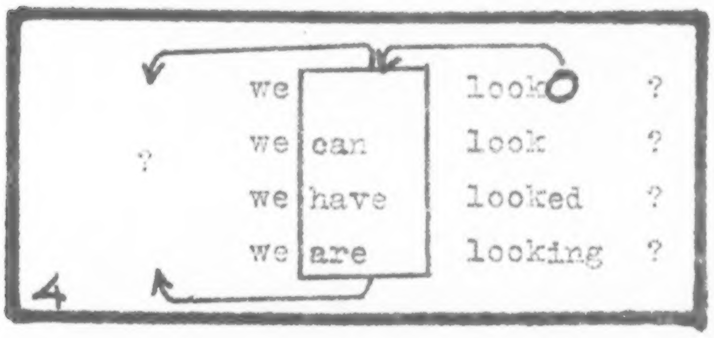
Manuscript for Slides

we look
we look
we look
we look
1

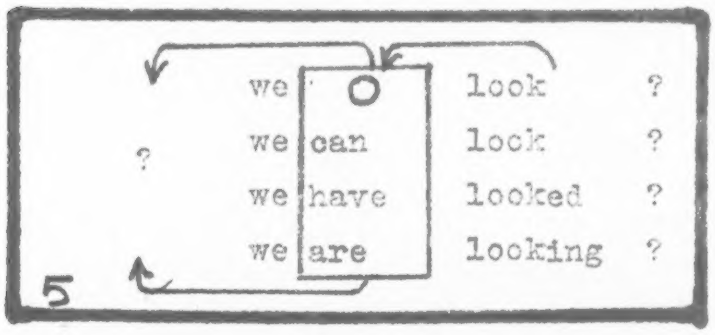
we look
we can look
we have looked
we are looking
2



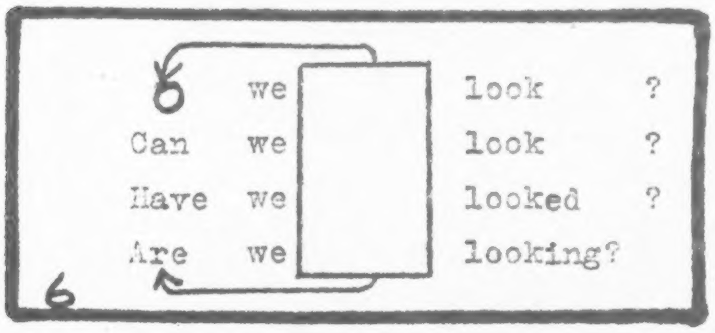
we look ?
? we can look ?
we have looked ?
we are looking ?
3



we lookO ?
? we can look ?
we have looked ?
we are looking ?
4



we O look ?
? we can look ?
we have looked ?
we are looking ?
5

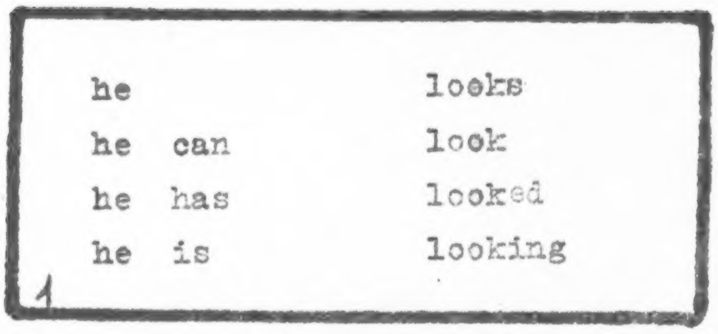


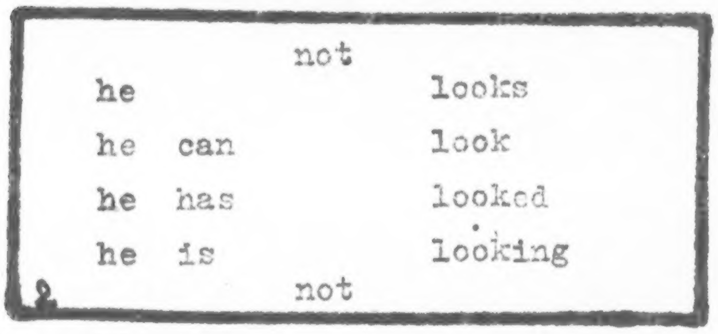
O we look ?
Can we look ?
Have we looked ?
Are we looking?
6

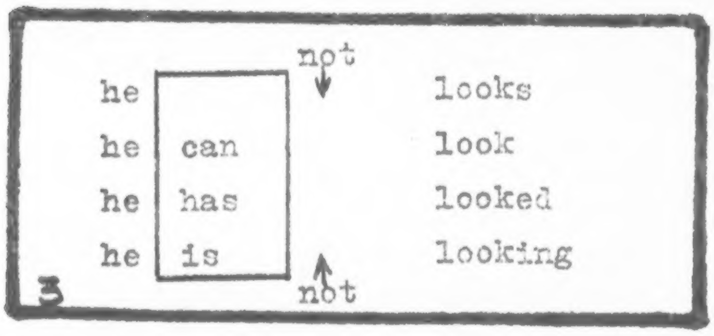
Do we look ?
Can we look ?
Have we looked ?
Are we looking ?
7

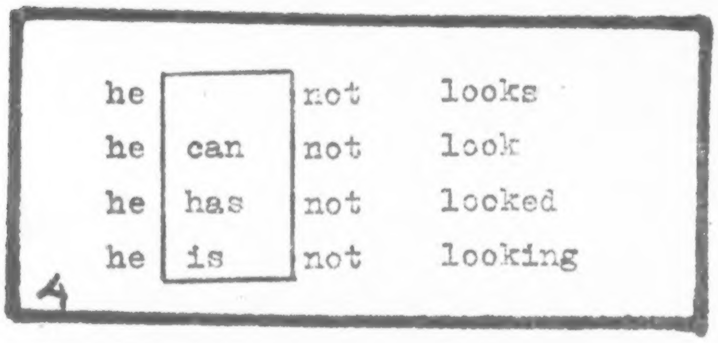
Ee and Es: Lesson 5

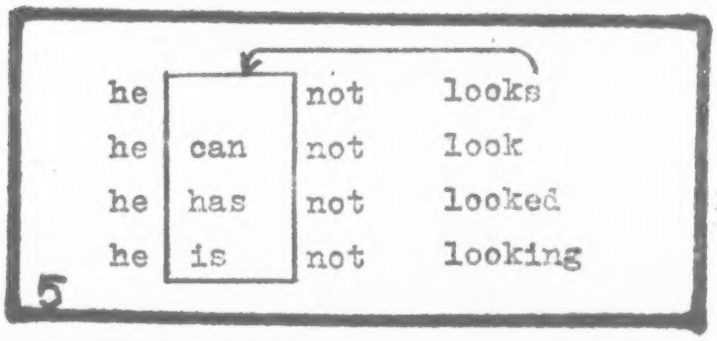
Manuscript for Slides

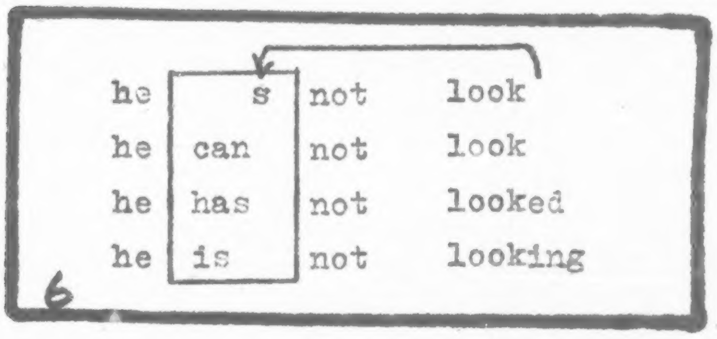

he looks
he can look
he has looked
he is looking
1

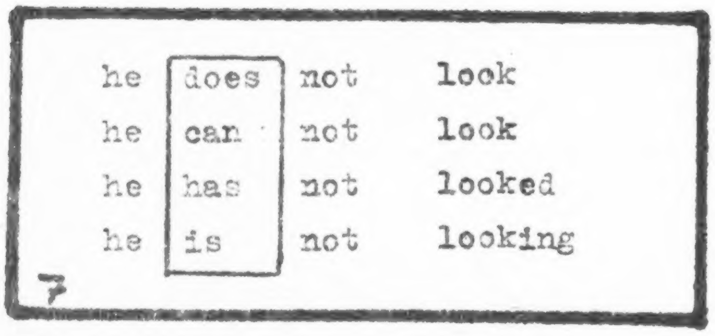

not
he looks
he can look
he has looked
he is looking
not
2

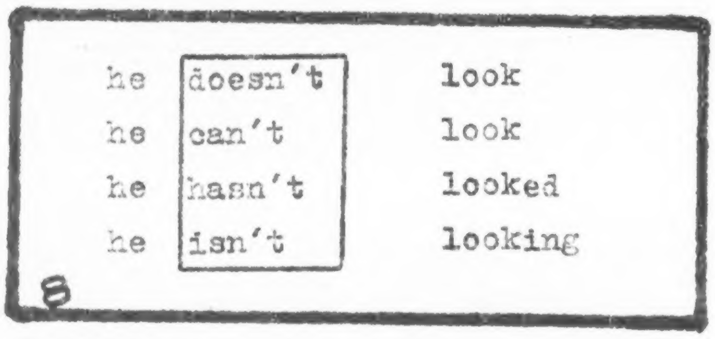

not
he looks
he can look
he has looked
he is looking
not
3

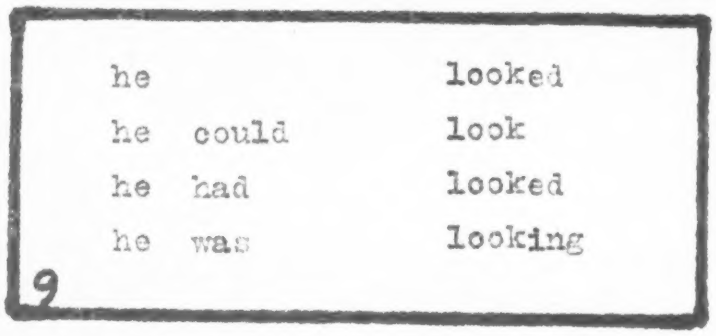

he not looks
he can not look
he has not looked
he is not looking
4

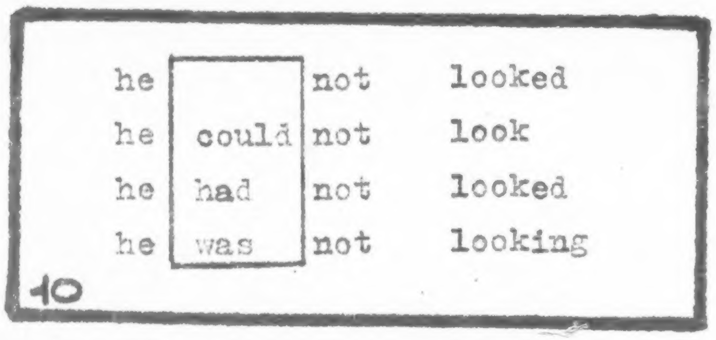

he not looks
he can not look
he has not looked
he is not looking
5

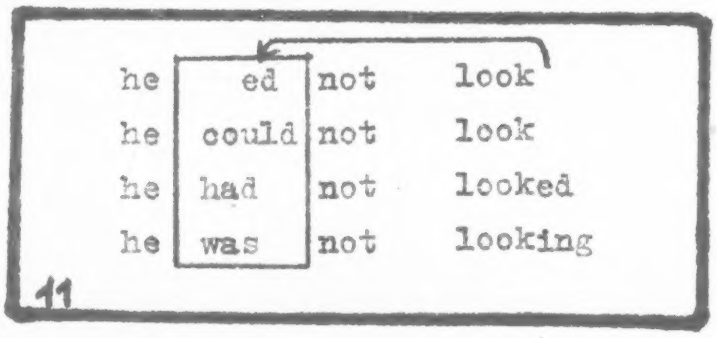

he s not look
he can not look
he has not looked
he is not looking
6

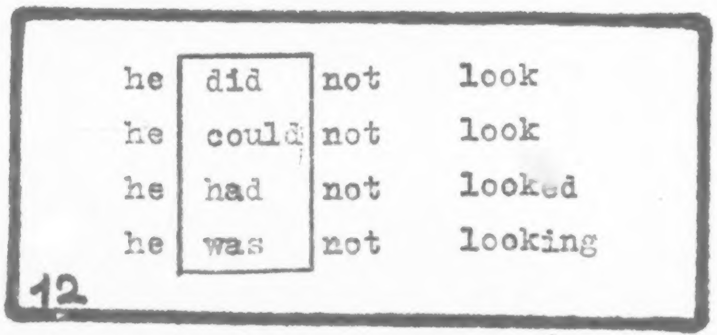

he does not look
he can not look
he has not looked
he is not looking
7


he doesn't look
he can't look
he hasn't looked
he isn't looking
8


he looked
he could look
he had looked
he was looking
9

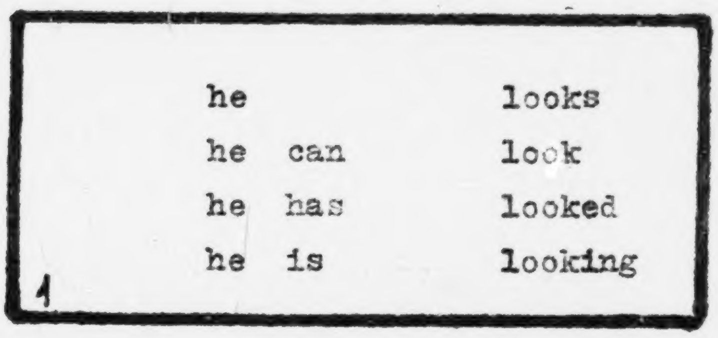

he not looked
he could not look
he had not looked
he was not looking
10


he ed not look
he could not look
he had not looked
he was not looking
11


he did not look
he could not look
he had not looked
he was not looking
12

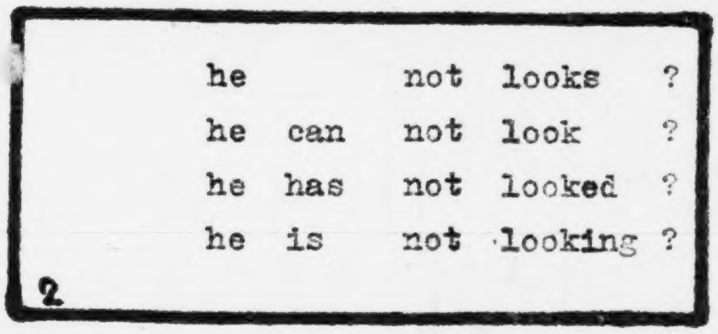
13: contracted forms: didn't etc,
otherwise same as 12 above.

Manuscript for Slides



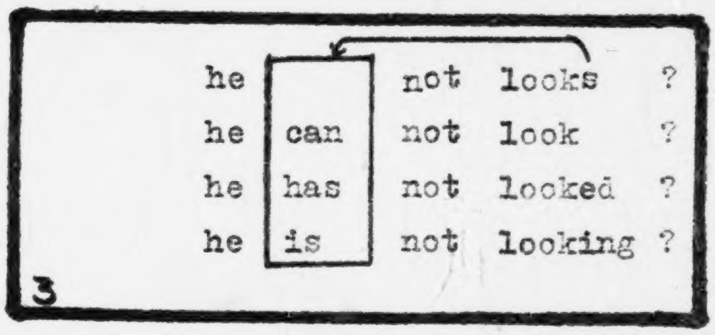
he looks
he can look
he has looked
he is looking

1



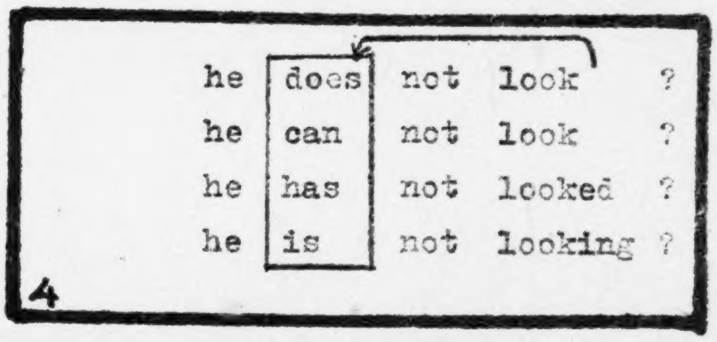
he not looks ?
he can not look ?
he has not looked ?
he is not looking ?

2



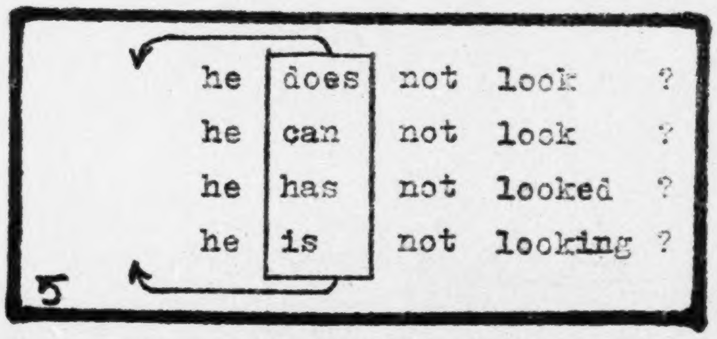
he not looks ?
he can not look ?
he has not looked ?
he is not looking ?

3



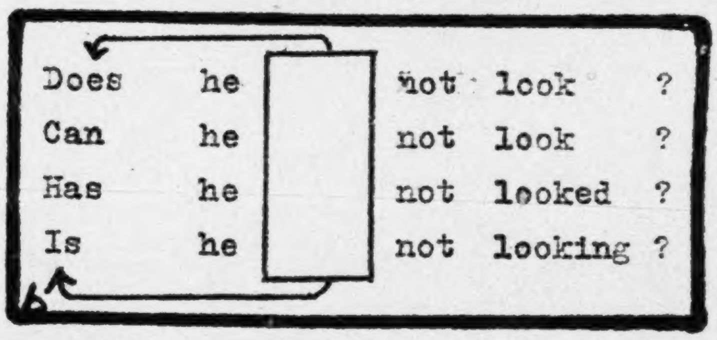
he does not look ?
he can not look ?
he has not looked ?
he is not looking ?

4



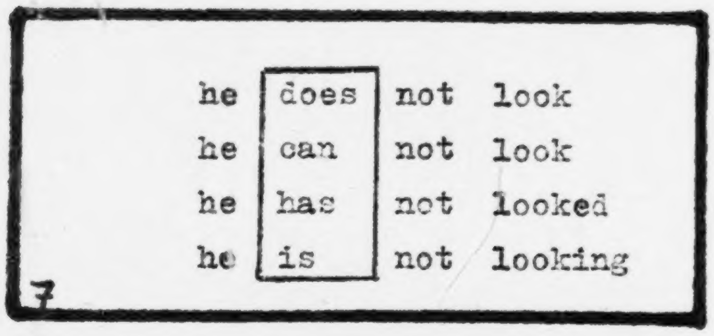
he does not look ?
he can not look ?
he has not looked ?
he is not looking ?

5



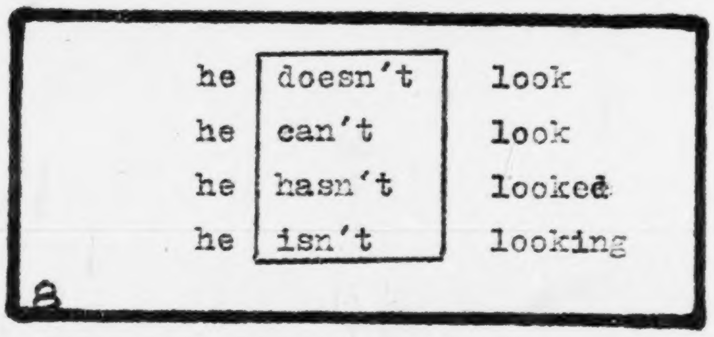
Does he not look ?
Can he not look ?
Has he not looked ?
Is he not looking ?

6



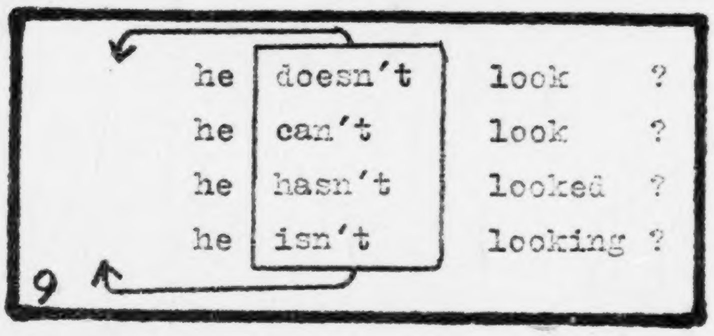
he does not look
he can not look
he has not looked
he is not looking

7



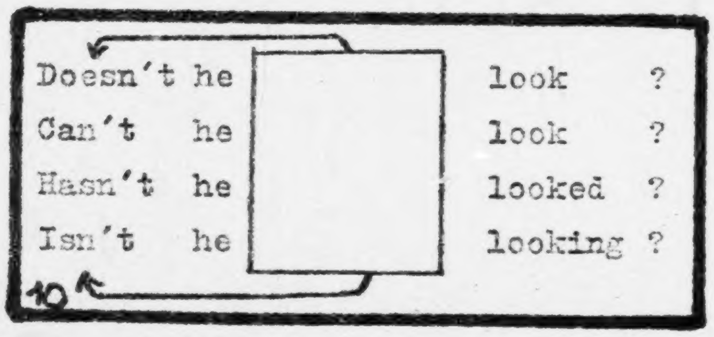
he doesn't look
he can't look
he hasn't looked
he isn't looking

8



he doesn't look ?
he can't look ?
he hasn't looked ?
he isn't looking ?

9



Doesn't he look ?
Can't he look ?
Hasn't he looked ?
Isn't he looking ?

10

GUME 2

THE SOME/ANY DICHOTOMY

/Ingvar Carlsson/

The Teaching Material

The teaching material can be divided into three main groups; oral drills, texts and written exercises. The proportions of speaking, reading and writing vary a little between individual lessons, but regarding the material as a whole, it will be noticed that considerable stress is put on oral drills. This strategy has been followed partly because skill in speaking is so emphasized in the Authorized Curriculum for Swedish Schools and partly because the overall teaching procedure and the activated headsets, in particular, seemed to invite the extensive use of oral drills. On the other hand it should be noted that drilling can be killing. With pre-recorded material it is extremely difficult to determine the optimal dose with regard to oral drills. If these are carried on relentlessly and if the student does not experience success, the effect can be negative and the result is fatigue and boredom (Cf. Rivers 1964). The introduction of texts and written work is calculated among other things to counteract or at least mitigate these undesirable effects. From this point of view these two features might be regarded as "time-out" for the students, short periods during which they can read, write or just listen.

Oral Drills

The structure drills aim to practise all the significant distributions of some and any and to ensure constant repetition. The oral drills proper consist of a question (stimulus) and the pupil's answer (response). As regards the oral work it is important to note a deviation from normal classroom procedure. In the classroom a drill is generally introduced by the teacher and submitted to the pupils for preliminary exercise (introductory stage). After an interval the same drill is taken up again for revision and overlearning. In this second stage the aim is to establish an automatic or clean unfaltering response (Cf. Palmer 1954, p. 21). The pupils should then be able to manipulate the drill without the help of any written pattern which means that the 'structure' should be well memorized. The procedure outlined above has not been adhered to in GUME 2, because, first of all, it was considered difficult or alien to the project to let the pupils work on their own and secondly because one of the by-products of the investigation was material production. Considerable effort has, therefore, been expended on producing a variety of drills. Consequently, drills have not been repeated in exactly the same form and this has necessitated some sort of visual aid, which, in this case means that the pupils have had the pattern in front of them during the entire exercise. Most drills in this project have been similar in one respect, which is that they have practised one specific feature e.g. one drill has been written to illustrate the use of some in one particular context and the pupils have used some all through the exercise. This inevitably means pure imitation and also monotony and therefore these "parrot drills" - although necessary at one stage - cannot be regarded as very powerful. "The frequency with which an item is practiced per se is not so crucial as the frequency with which it is contrasted with other items with which it may be confused". (Cf. Carroll 1966, p. 104) What the writer of drills is anxious to achieve is what might be termed the constrastive drill, where the pupil is called upon to use his built-in grammatical knowledge and to select the relevant item for his answer. These checking-up drills do not normally prove insoluble and with the do-construction for example, they are tackled as a matter of course. But the combination some/any is an altogether different matter and a practical method for checking the distribution of some/any orally has not been found. It has, therefore, been necessary to do the checking by means of the exercises for writing which will be discussed later.

Outline of Oral Drills. The oral drills are designed to establish a pattern. It is generally considered that the establishing of a pattern requires between 6 and 10 items, question and answer being regarded as one item (Cf. Stack 1960). In GUME 2 all the pattern drills meet this requirement. What happens in this project is that the pupils listen to two examples. They are then expected to be able to understand the exercise and answer on their own. Most drills are so-called four-phase drills (question-pupil's answer- correct answer - pupil's repetition of the correct answer). In some cases a number of stereotyped dialogues have been converted into drills by simply letting the pupils act one of the parts. In all these instances the pupils have listened to the conversation first, before they have been invited to take part. These dialogue drills have all been of the three-phase type i.e. the pupils have not been given time to repeat the right answer. This is on the assumption that repetition would be too tedious and time-consuming.

Oral Drills for Im and Ee/Es. It is important to note the difference between the Im and Ee/Es variants with regard to oral work. The time for explanations in the Ee/Es groups is to a great extent taken from oral drills. The explanations or analyses are thus given at the expense of oral practice. The table on the next page shows the relationship between two teaching variants with regard to oral drills. The time is given in minutes.

Table A 3. The Difference Between Im and Ee/Es with regard to Oral Drills

Lesson	Im	Ee/Es
1	18	10
2	10.45	6.30
3	21.45	15.00
4	17.35	12.05
5	17.10	12.30
6	15.15	6.15

Texts

With one exception (lesson 5), the texts are identical for both implicit and explicit groups. This procedure has been adhered to quite strictly since it was felt that a teacher-led exercise, involving production and participation would be more powerful than the mere reading of a text, where the student in the implicit group at least would have been left entirely to his own divices. This is particularly true of the GUME procedure where the student has no chance to ask questions and where there has been no attempt at close reading, followed by detailed questioning. This is a significant deviation from prevalent classroom procedure, but it has been made - I think necessarily - because this in itself higly valuable approach requires the presence of a teacher to be really stimulating and rewarding. The texts, then, are regarded not so much as exercises but rather as a method of introducing and revising the characteristic distributions of some and any. In this respect the texts are of vital importance.

Criteria for the texts. Ideally the texts to be included in the material should meet certain requirements:

1) They should be fairly easy, interesting and deal with everyday situations
2) They should introduce new grammatical content gradually i.e. they should be carefully structured
3) Besides the introduction of new grammatical material, the texts should abound in representative examples demonstrating the distributions of some and any, thus providing continual repetition.

With these ideal requirements in mind the most pressing and difficult problem during the preparatory stages of the project was to find suitable texts. None of the current text books used in class 7 in Swedish schools could provide material, which, however is hardly surprising. The teaching of the complex some/any in Swedish schools is spread out over a period of four years or more and no text book treats this problem separately.

But this is precisely the aim of GUME 2. In six lessons the material is designed to provide a comprehensive treatment of some/any. The idea of using existing texts had to be discarded because of this. Furthermore, the use of texts already on the market might give certain classes an unfair advantage.

The only solution, therefore, was to write texts. This was done, partly by Michael Walker B.A., who is responsible for the story about Roger. This story is inserted as a serial in all lessons but one. The remaining texts have been written or adapted by the author.

Written Exercises

The exercises for writing are used to give the pupils the opportunity of checking their knowledge and also to give some variety. The exercises are of two types:

1) Questions on a text the pupils have read and listened to
2) A short text or dialogue with the crucial words omitted

All the exercises are meant to be quite easy, because they are based on examples the pupils are acquainted with and so the pupils have been given comparatively little time to complete them. After the interval the right answers are given once, but the pupils are not given enough time for marking on a large scale. This led to a few complaints and it might therefore have been better to have given the correct version twice.

As the exercises for writing also act as the checking exercises they are perhaps particularly important for the Im group. In the Ee/Es groups this role is taken over to a great extent by the explanations. The relationship between written work in the two variants is shown in the table below.

Table A 4. The Difference Between Im and Ee/Es with Regard to Written Exercises

Lesson	Im	Ee/Es
1	6	3
2	7.15	2
3	2	-
4	2.40	-
5	6.50	4
6	6.10	-

Definition of the Grammatical Problem

The aim of the six lessons was to teach some/any and their combinations. Thus the aim was stated in very general terms. The immediate problem was therefore to limit the grammatical content and decide what patterns to use in the material, or rather to find out what patterns were most suitable for practising the grammatical functions.

Situational Grammar. Attempts have been made to avoid the practising of grammatical items in isolation. The drills or exercises always start with an introduction which can be of different kinds, a picture, a text or just a few hints that make the situation clear. This device of introducing the exercise is felt to be most important in the implicit variable, where the pupil must draw his own conclusions. The idea is that the pupil will remember the situation where a specific pattern occurred and automatically reproduce the relevant item when the situation demands it. (Cf. Carroll, 1966, p. 105)

Grammatical Content. The following table is an attempt to show when an important pattern was first introduced. None of the exercises aimed at revision and repetition has been taken into account.

Table A 5. Survey of the Grammatical Structures

Lesson	any	some
1	I can't see any cats Can you see any cats?	I can see some books
2	He hasn't got any pens, but	he has got some pencils Somebody will answer it
3	There isn't anybody in the garden Was there anybody in the garden? He hadn't bought anything He seldom buys anything He went away without telling anybody He left without saying anything	Somebody was here yesterday There is something on the table
4		Would you like some grape-fruit? Why don't we grill some steak?
5	He speaks better than anybody else Anybody can do it Any colour will do He doesn't do anything but work	
6	I didn't read any of them	I read some of them I took some of it Some books are difficult

Comments on table A 5. *Lesson 1* is devoted mainly to revision of patterns that the pupils have encountered during the spring term of class 6. *Lesson 2* starts with a repetition of the material dealt with in lesson 1. *Somebody, something*, *anybody*, *anything* are introduced. *Lesson 3* lays special stress on *anybody, anything* but *somebody* and *something* are also practised. The use of *any* after words like 'seldom' and 'without' is also included. *Lesson 4* attempts to illustrate the use of *some* in questions. *Lesson 5* gives a number of patterns where *any* is used in factual sentences i.e. sentences that are not questions and not negative. *Lesson 6*. The only new item introduced here is meant to illustrate that *some* and *any* can be used before 'of'. It also gives examples of *some* used with stress (e.g. Some people like English and some don't).

The Relevance of the Grammatical Content. The question immediately arises as to whether the grammatical content is sufficient. To put it differently: Is it relevant to what the pupils are expected to learn in class 7? The Authorized Curriculum for Swedish schools does not give detailed instructions. To get some idea of what the pupils actually read about these matters we must therefore study the current textbooks used in Swedish schools. Basing our view on a survey of the workbooks attached to the textbooks, we might conclude that most textbooks concentrate on the 'normal' usage i.e. *any* in negative sentences and in questions and *some* in affirmative sentences. There are virtually no exercises dealing with other aspects of the problem. The material in the text books is roughly covered by the first two lessons in the GUME-material. We may conclude therefore that the teaching material of sub-project 2 goes well beyond what the pupils normally encounter of the *some/any* complex.

The Explanations

The Implicit variant is implicit in the extreme. There are no explanations of any kind. The stress is entirely on practice and the reasons for the various exercises are never overtly expressed. The implicit variant is without 'grammar' unless we mean that the ordering and structuring of the various items constitutes the grammar of the language. The hypothesis is that any theorizing, any analysis will serve only to confuse and bewilder the student and thus impede fluency (the audiolingual habit theory, cf. Carroll, 1966).

The other experimental variant relies on the hypothesis that insight is necessary and makes learning more effective and accurate (the cognitive code learning theory, cf. Carroll, 1966). This insight or awareness should be explicit. We should inform the student what we are doing and help him to draw the conclusions, which should be a summary of the patterns that have been practised.

The Length of the Explanations. It was desirable, for experimental purposes, to have the explanations as a constant factor of equal length in all the lessons. What was this length to be? From the teaching point of view it was felt that an ´explanation time´ of three minutes per lesson would be enough. But for experimental purposes, the variation in the time element was considered far too small for any conclusions to be based on this variation exclusively, especially in a short-term experiment with pupils in their 4th year of English. The time for the explanations was therefore increased to 9 minutes per lesson. The time devoted to explanations or analysis in the Ee and Es groups respectively are shown in the following table.

Table A 6. The Length of the Explanations

Lesson	Ee	Es
1	10.40	10.10
2	8.45	8.00
3	10.00	9.00
4	8.20	7.56
5	8.00	8.35
6	10.51	10.35
	56.36	54.10

The total ´explanation time´ for all six lessons should be 54 minutes. As can be seen in the table the explanations in English slightly exceed that figure.

Types of Explanations. In most Swedish school grammars the usage of some/any is explained by reference to the sentence types in which they occur. Thus any is used in negative sentences and in questions while some is used in affirmative sentences. Then there are rules for why some is also used in questions and why any is used in statements when the basic meaning is negative, or with the meaning ´vem/vilken/vad/som helst´ in Swedish. To avoid this complexity we preferred to treat some/any as a semantic problem. Any means ´any at all´ (någon alls, någon överhuvudtaget, någon som helst), while some has a more specific and restricted meaning (någon viss, någon sorts, somliga). This distinction is hinted at in Löfgren (1950, p. 87) and treated more fully and systematically in Ellegård (1969, p. 42-45). With this analysis it is possible to treat the whole complex without the involvement of exceptions. On the other hand, it was not considered prudent to demolish the knoledge the pupils already had. It was therefore repeatedly stated that any has the meaning ´any at all´ and that this meaning is particularly common in negative sentences and in questions.

Explanations of a semantic type are comparatively easy to handle in the group where we had recourse to Swedish. In the Ee group we used the helpword ´at all´ consistently. A typical direction to the pupils might thus run like this: "Use any in sentences where you can put in ´at all´ and where this gives a correct meaning." It is, of course, doubtful whether all the pupils understood this or developed a feeling for it.

Explanations - Exercises in Disguise? Unfortunately, the 9 minutes per lesson stipulated for explanations made these rather verbose and long-drawn-out. Visual aids in the form of grammar sheets were introduced to prevent interest from flagging. These replace the phrases or patterns the teacher normally writes on the board while explaining. For administrative reasons the grammar sheets vary in colour; they are green for the Ee group and red for the Es group, but otherwise they are identical. The sheets usually consist of a few sentences that are discussed and analyzed. There is even some practice in that the pupils are sometimes asked to repeat a sentence pattern. This device might possibly in some little measure obliterate the line between the experimental variants, but all the same it was felt to be absolutely imperative to alleviate the inevitable boredom arising from the lengthly arguments. This device in itself cannot be held to be alien to the explicit methods; nor is this repetition or chorus reading - regarded as an exercise - very powerful.

GUME 3

THE PASSIVE VOICE

/Margareta Olsson/

The Teaching Materials

The design of the separate lessons within the three sub-projects followed the same pattern. Each lesson was to be divided into three parts devoted to oral drills, written exercises, and the reading of texts respectively, and the teaching material was written with this division in mind. The grammatical explanations were to take three minutes of each part of the lesson. This means that the students of the Ee och the Es variants had less time for oral and written exercises than the Im group.

The proportions given to the different activities should not be interpreted to mean that the grammatical explanations always took up three minutes regardless. In reality, they could take from one to four minutes. The important thing was that they should add up to nine minutes per lesson. It must also be stressed that the written work was not limited to the second part of the lesson. During an explanation the student could be asked to fill in a few words just to keep him "ticking over", as it were, and to prevent possible loss of interest. Grammatical explanations and written exercises were sometimes intermingled in the second part of the lesson so that the students were first asked to write sentences according to a given pattern and afterwards to turn to the next page where the correct sentences had been printed. After the student had checked his own version, he was to make observations on some part of the sentence. The texts intended for reading in the third part of the lesson were, as a rule, followed by questions on the content. The answers were to be written. This section of the third part was designed for those students who worked faster than the others, and, consequently, had to be kept meaningfylly busy.

The four skills mentioned in the Authorized Curriculum for Swedish Schools, i.e, listening, speaking, reading, and writing are thus represented in each lesson. The students start with listening, go on to speaking practice, reinforce the oral exercises with written work, and finally, during the last part of the lesson, when the students should rightly be allowed to relax a little, they listen to dialogues spoken by native Englishmen while they themselves have the texts in front of them.

Oral Drills. According to Palmer (1965) the study of languages is essentially a habit-forming process (p. 38) and language learning situations must therefore be carefully structured to exclude the possibility of error on the part of the student (p. 74). He stresses the importance of meaningfulness, variation, and stimulation in these automatic habit-forming activities (p. 57). Jespersen (1961), too, recommends repetition and transformation drills (pp. 107-8), devices which were to be stressed so much later by the audio-lingual method. The stress on the spoken language ("Language is speech") is today something quite undisputed in classroom practice. The strict behaviourist opinion advocated by Skinner (1957) that language is behaviour and language acquisition only a matter of acquiring automatic habits, is, however, not universally accepted. Today, drills have also been heavily critized. It is perhaps doubtful whether even the most carefully graded and structured material will make the pupil arrive at the right conclusions about the language, and, in that case, what is the use of practising without understanding? Practising one single structure in very concentrated doses is even said to be harmful to the student (Cole, 1969, p. 129). It has also been found that "over-learning" of a pattern can result in a fixed and stereotyped behaviour so that the student cannot vary his responses (Rivers, 1964, p. 151).

In the arguments for and against an excessive use of drills, the theories of whether language acquisition is a mechanistic or a mentalistic process are at issue. The mentalistic theory claims that drills in language teaching can only serve as a foundation for higher intellectual activities (Chastain, 1969, p. 102). The mechanistic, or habit-formation, theory sees language acquisition as a series of stimulus-response situations through which the student is led until he masters each structure with an automatic non-thinking skill (pp. 99, 106). Both the theories thus acknowledge the value of drills, but disagree on the extent to which they should be used. It has also been suggested that there may be different levels of language learning, and, if this is correct, that provision should be made for instruction to be carried on at different levels (Rivers, cp. cit. pp. 43-6). If this assumption is applied to drills, it would mean that not all students should have to go through the same number of drills when learning a particular point of grammar.

For this experiment the starting-point of the drill section of the lesson was in most cases a dialogue. The dialogues were followed by systematized series of structure drills. An effort was made to have contextualized drills as far as possible in order to avoid the use of isolated sentences. The procedure chosen for this project is thus very similar to what advocates of the audiolingual method would have chosen.

The same material for the drills was used for the three teaching strategies within the experiment. To a very great extent the Im-variant is dependent on the fact that the structure drills are so arranged that they make the systematic functioning of the language clear to the student. Consequently the difference between the Im-variant on the one hand and the Ee- and Es-variants on the other is, that in the latter two cases there was an explicitly formulated generalization or explanation based upon observations of which facts governed that particular language situation.

Of the six lessons all except number two begin in the same way, that is, with a dialogue to which the students listen before they begin speaking themselves. The particular pattern which was the aim of that lesson was used over and over again in the dialogue, and in the drills which followed the student could be asked to act one of the parts of the dialogue. Drills should be monostructural and preferably involve only one operation at a time. Owing to the special character of the passive voice this was not possible. In the transformation drill, for instance, the change from active to passive or vice versa can mean that not less than three manipulations of the parts of the sentence must take place.

Once in Lesson 1, in the Im-variant, the pupils were given four-phase drills. All the other drills were three-phase drills. As the students were always given model sentences before the drill proper started, the possibility of error was not great, and as in any case correction was immediate, it was considered satisfactory for them to hear the master response once without repeating it. Repetition, substitution, and transformation drills were used as well as question-and-answer exercises. It was the exception rather than the rule that some kind of written stimulus was given during the drills. Other stimuli, such as pictures, were used in lessons 3, 4, and 5.

In order to keep the student´s interest alive during the drills there was a story, continuing from Lesson 2 to Lesson 6, about the Barkers, an English family. The drills were to a great extent built upon the activities of the different members of this family.

Material for the drills of Lesson 1 was taken from a programme by Sveriges Radio, English For Pleasure, called Use Your English, and originally broadcast in 1966. The rest of the drills were written by the present author.

Written Exercises. As mentioned earlier, the purpose of the written exercises was to consolidate what had already been taught during the oral drills. The written work was in most cases heavily structured, so that the chances of mistakes were minimal. Model answers were given to the students before they started to write. When this was not the case, the students were afterwards given the correct answers to, for instance, the fill-in exercises, and these were read at a very low speed so that quick-witted students had time to fill in the correct words if they had not done that earlier. Sometimes the students were asked to write exactly the same drills which they had worked on during the oral exercises.

Since a connected piece of prose is bound to evoke more interest than disconnected sentences, an effort was made to include as many such texts as possible among the written exercises. A great variety of other kinds of written work was also employed, including substitution tables, fill-in (two-choice) exercises, question-and-answer drills, and transformation drills (passive to active).

The fill-in exercise can be regarded as a kind of check-up to see if the student has really mastered the structure and would be able to use it in a new context. There is only one exercise of the kind where the student should himself organize the passive construction of the verbal part with only the infinitive of the main verb given as a basis. This exercise has, for obvious reasons, been placed in the sixth lesson. In Lesson 5, there is another fill-in exercise, but there the student is given the expressions he should use. His task is to find out where to insert them. With this kind of exercise it is essential that the correct version should be read to the student when the time given for work on their own has elapsed.

The written work after the reading texts always consists of questions on the content of these texts. The questions either allow more or less "open" answers, or give the answers in the form or multiple choice (three- or four-choice).

The Reading Texts. The texts for the third part of the lesson, that is for the reading, were the same for all the three teaching strategies. Reading means here that the students had the texts in front of them and listened to a performance by native speakers. By this device the difficulty which the pronunciation would otherwise have presented, was avoided.

Words which were presumed to be new to the students were given in Swedish in the margin. The texts were read as dramatically as possible and had been chosen carefully so that the students would be able to hear copious examples of the passive voice, but in new, interesting contexts.

As these texts were to demonstrate the tense which was the particular objective of the lesson in question, it was futile to hope that anything suitable would be readily available. There were further requirements which also had to be met. The distribution of the passive voice in colloquial, everyday language is not very dense (Noam Chomsky, 1957, pp. 79-80), but here it was necessary to have life-like, colloquial language as well as many examples of the passive voice. Furthermore, the texts had to be attractive and interesting to the students as well as easy to understand. The present writer decided to approach two English professional authors, Mr. David Rush and Mr. John Jory with a request to write texts for the experiment along these lines. The first answer was no. They did not consider it possible to write dialogues with a high distribution of the passive voice without arriving at a very affected and strained language. A certain amount of persuasion was needed before they finally acquiesced. The result was dialogues full of action and variety and with plenty of examples of the passive voice.

The reading text for Lesson 1 differs from the others in that it is not a dialogue but a short prose passage taken from George Mikes´ How to Scrape Skies.

The Grammatical Point

The guiding principle for the selection of grammatical points as the basis for this assessment of the effectiveness of different methods has been the question of whether the English grammatical point chosen is represented by a dissimilar construction in Swedish. This is the case with the do-construction as well as with some/any, which are the grammatical structures dealt with by sub-projects I and II. The grammatical point singled out for GUME 3, the passive voice, conforms to this requirement, too, as the Swedish passive construction can be formed in two very different ways, while there is, broadly speaking, only one corresponding way in the English language. It must be acknowledged that the passive voice in English quite as in Swedish does not represent an extremely frequent or indispensable construction, but, nevertheless, the choice of the passive voice in this case can well be defended as even unusual grammatical structures can serve as a basis for the special purpose of this investigation.

The Authorized Curriculum for Swedish Schools mentions the passive voice as one of the grammatical points to be learnt in forms 7-9 of the more difficult streams, i.e. Sk. The Curriculum does not require the pupils of the easier stream, Ak, to learn this item as their studies should only consolidate the grammatical points mentioned for forms 4-6 where the passive voice is not included. Current textbooks used in Swedish schools in form 7 introduce and drill the passive voice both in the textbooks and the workbooks. This is true to a lesser degree of the text- and workbooks explicitly written for the easier stream. In this connection it can be mentioned that in Hensjö's Build Up Their English, a book containing practical advice for teachers of forms 5 and 6, the passive is dealt with (pp. 121-4). It is thus not entirely out of place that the pupils of the easier stream should receive instruction on the passive voice within the framework of the project.

That pupils should attain complete mastery of all the aspects of the passive voice in English cannot be hoped for in form 7, be it within the framework of a project like this or during their ordinary lessons. As a matter of fact, the passive can be considered to be a complicated construction, as the transformation from active to passive involves three steps: 1. placing the subject after the preposition by, 2. moving the direct object to the place formerly occupied by the subject, 3. introducing be before the main verbal part of the sentence (Thomas, 1966, p. 192). These special circumstances necessitated a strict definition of the passive voice, an enumeration of its different functions based on this definition, and finally a selection of the items which could reasonably be used whitin the project.

The passive is here defined as a construction containing a form of the verb be plus a past participle. In English this construction can denote a state or a condition as well as a change of condition. For this experiment the latter case will be the more interesting, as the former case can be interpreted by a Swede as a form of the verb be plus a past participle functioning as an adjective. This case does not represent any difficulty to Swedes and need not be drilled or explained. (Cf. The house is already painted - Huset är redan målat).

A further problem was represented by the question whether there is, in fact, a correspondence between active and passive sentences, a question which is answered in the affirmative by some linguists (Chomsky, Ellegård, Svartvik) and in the negative by others (Cooray, Allen). Allen even considers that great harm has been done by giving the students the impression that there is a direct correspondence between active and passive sentences. (p. 289) To take sides is for the writer of vital interest as the passive sentence is often practised as a transformation of the active and explained in the school grammar as derived from it. The example "Joe married Jill" compared to "Jill was married by Joe" makes for doubt about his assumption, just as it is evident that sentences without an agent, as, for instance, "Her father was killed in the war", cannot immediately be turned into the active. As this experiment is in part founded upon Chomsky's theories, is was decided to adopt his definition of the relation between active and passive sentences. As passives must be regarded as less central than actives it is natural to consider them to be derived from actives and not vice versa. This experiment will deal with the initial stages of teaching the passive voice, and thus only degrees of high correspondence between active/passive can be to the point when making use of transformations in the instruction. The choice of verbs can be less restricted when the text or the exercises do not compare the active to the corresponding passive sentence or vice versa.

The Explanations. The grammatical explanations which have been used within GUME 3 for the explicit strategies are of a formal as well as of a semantic character. Formal criteria are used when changes in the word-order in the transformation from active to passive are demonstrated. When it is pointed out that an active sentence has the same meaning as the corresponding passive sentence, semantic criteria are used. The explanations start with the active sentence as a kind of kernel sentence and describe how the passive is derived from it. The grammatical model underlying the instruction is consequently the transformational.

All in all there were nine minutes of explanations each lesson. This is a fair amount of time as the lesson lasted about 30 minutes. During the course of ordinary instruction, grammatical explanations do not take up one third of the time. For experimental purposes, it was, however, considered necessary to choose a length of time which would give distinct evidence of the effectiveness of the methods in question.

The place of the grammatical explanations has in this experiment been governed by Palmer's (1965, p. 85) principle that the example should precede the rule. Whether the explanations should come after one or two examples or when the pattern has been practised for a while is a really tricky problem. It is rightly feared that the student might form his own rationale for the pattern if he has to wait too long, and as the teacher cannot supervise him here, this private explanation may be inaccurate and can cause much loss of time later (Rivers, p. 152). As the passive voice is a complex grammatical structure, it was felt that the student had to handle it several times, before the explanations started. Therefore, it was decided that the first seven minutes of the lesson should be given up to oral drills only, and after that the explanations were to start. It is quite possible, in this case, to declare that since the explanations thus take place fairly late in the oral part of the lesson, they are also valid for the written exercises (which, after all, do not introduce any new problem), and so they can be considered to be at the beginning of the written exercises, which, in their turn, are rounded off with further analysis and discussion of the same problem.

The students never saw the grammatical explanations in print. They had special work sheets for the grammatical part of the lesson in front of them; for the Ee group on green paper and for the Es group on red paper. The particular sentences which were the object of the lesson in question were printed on these sheets, and the pupils were asked to make observations on different functions of the passive voice. It was considered advisable with this age-group not to tax their listening ability too heavily. During the explanations they were thus asked to fill in missing words, to underline sentences and to draw lines to mark how the same words had different positions in the corresponding active and passive sentences.

As it is a good rule to proceed from the known to the unknown, the explanations started with the active sentence and stressed that it had the same meaning as the corresponding passive sentence, which to the students was a less well-known construction. The sentences which were discussed had been taken out of material which the student had already worked on during the preceding part of the lesson. Thus grammar was never discussed in disconnected sentences or without a context but always in connection with a situation already known to the students and in sentences familiar to him.

Grammatical Content Per Lesson. The lessons of GUME 3 have been arranged so that Lessons 1 och 2 treat the present tense, that is, Lesson 2 mainly revises and reinforces what was taught in Lesson 1. Lesson 3 treats the past tense, Lesson 4, the perfect tense, Lesson 5, the pluperfect, and Lesson 6, a few modals (will, can, must) plus the passive infinitive. (Table A 5). The grammatical explanations, however, start during Lesson 1 with examples in the past tense. It was considered that the sentence "Mr. Roberts keeps the money" offers more difficulties to a Swede when transformed into its passive correspondence "The money is kept by Mr. Roberts "than the same pair of sentences in the past tense (Mr. Roberts kept the money/The money was kept by Mr. Roberts). In the latter case only the word-order is changed and a few function words are added. If the present tense had been chosen the change of the word-order and the additional function words would not have been enough, but the shape of the verbal part of the sentence would have had to be thoroughly changed from keeps to is kept. There is no special lesson entirely given up to explanations about the changes from active to passive in the present tense.

The first lesson of the experiment limits itself to describing how the subject of the active sentence changes places with the object when the sentence is made passive. The verbal part of the passive sentence is not dealt with until the third lesson. There is no doubt that this part of the sentence is the most difficult for the student, and it was therefore split up into two parts. During Lesson 3 and 4 attention was focussed on the main verb of the verbal part, while the fifth and the sixth lessons discussed the auxiliaries. From the first to the last lesson there was a continual revision during the explanations of what the preceding lessons had dealt with.

In addition to the points mentioned above, number is discussed briefly in Lesson 4. It is mentioned only in passing, as mistakes in number were not to be marked in the tests. Furthermore, active sentences with a direct object as well as an indirect object are transformed into the passive in Lesson 2, Part B, but only within the Ee-variant. In the corresponding section of the Es-variant, the two different possibilities of translating an English passive sentence into Swedish are discussed. As this is a problem which is not discussed in the Ee-variant, the result is a gain in time within this strategy, when the Es-group have comparisons with the Swedish language.

Table A 7. Distribution of the Different Phases of Instruction During the Six Lessons of the Project.

Lessons	Im, Ee, Es Tense treated in texts	Es Comparisons with the Swedish construction	Ee, Es Revisions of tenses learnt previously	Ee, Es Relation subject-agent main theme	Ee, Es Verbal part main theme	Ee, Es Comments on sentences without an agent	Ee, Es Number
1	Present			X		X	
2	Present	X		X		X	
3	Past	X	X		X		
4	Perfect		X		X		X
5	Pluperfect	X			X		
6	Modals + Passive inf.		X		X	X	

Grammatical Terms. As the lessons were delivered on tape, the explanations had necessarily to avoid technical expressions as far as possible, so that these would not form a barrier and hamper the comprehension of the explanations. The grammatical terminology needed was, therefore, chosen with great care. The expression "the passive voice" was ruled out because of such considerations and instead the explanations talked about active and passive sentences. What the word "passive" means was made clear by descriptions of the behaviour of passive and active people.

To include terms for the tenses was not necessary for the purposes of this experiment, and they would undoubtedly have rendered the understanding of the explanations as a whole more difficult in classes where they had not previously been employed. In order to be able to mention the different parts of the sentence without using the designations "subject", "object", and "agent", the elements of the sentence were numbered with the figures 1, 2, and 3. Thus the subject of the active sentence was called part number one, the verbal, part number two, and the object, part number three. This procedure made it possible to describe the transformation of an active sentence into the corresponding passive sentence by pointing out how part three in the active sentence moved to the beginning of the passive sentence, and how part 1, preceded by the preposition "by", was places at the end of the passive sentence. It was finally stressed how part two, the verbal part, kept its place in the middle of the sentence.

For the discussion of part number two, the terms "little verb" (the auxiliary) and "head verb" were introduced. It was also necessary to deal with the principle parts of the main verb to be able to point out that the third form of these was used in part two of the passive sentence. The expression "the three parts of the verb" was chosen when talking about the principle parts. It is probable that the students had come across this expression in form 6, and in any case, even if this was not so, it is impossible to misunderstand the expression, as the three forms were pointed out in written form at the same time as they were discussed.